

# REGIONAL GUIDELINES FREIGHT THROUGH TRAFFIC ROUTING TO AVOID RESIDENTIAL AREAS



## TRACECA II Regional Road Safety Project Freight / Road Safety Engineering Team

Compiled by

### Core Technical Team

Dr Alan Ross, Team leader and Road Safety Adviser (e-mail [alanross999@gmail.com](mailto:alanross999@gmail.com))

Dr Dejan Jovanov, Senior road Safety Engineer (e-mail [dejan.jovanov68@gmail.com](mailto:dejan.jovanov68@gmail.com))

Ms Mariya Ivchenko, Regional Project Coordinator (e-mail [mariya.ivchenko@gmail.com](mailto:mariya.ivchenko@gmail.com))

### Administrative Support

Ms Anastasiia Kovalenko, Administrative Assistant

With inputs from the Kiev Project office staff and all the individual experts indicated in the individual sector specific reports.

*December 2015*

EU funded road safety project  
for

Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Moldova,  
Tajikistan, Turkmenistan, Ukraine, Uzbekistan



## PREFACE

The movement of road freight has generally doubled globally in the last twenty years and is forecast to double again in the next twenty years. The distribution of goods and services relies heavily on the freight industry, and does the global postal system.

Roads that are important for major freight movements have a different role and function to most other roads. They require specific treatment and management. Increasingly, road agencies are realising that there are significant benefits in publicly identifying freight route networks, and investing in their maintenance or improvement. Countries recognising the opportunities including the European Community, have commenced publicly identifying freight route networks of different types, mainly through statutory planning processes.

The Austroads Freight Program has led this recognition, and their approach to thoroughly research and provide planning guidance on how to facilitate increasing demand for freight, while addressing community issues and their concerns.

As part of the TRACECA project and document package, this report outlines a guideline for such objectives. It offers processes for identifying and planning rural and urban freight routes of importance. Focusing more towards the urban situation where freight transport movement is concentrated and the community is potentially negatively impacted by the road freight.

This guideline outlines why and how to identify road freight routes that are of economic importance for the growing freight chain and offering the industry suitable options for distribution and transit travel. It explains why road freight networks need to be identified and the benefits. It provides processes through various approaches to planning for each issue, including protecting community interested as well as road freight economic importance through statutory planning mechanisms.

Road authorities should be encouraged and apply a number of innovative approaches to identify and support freight routes for specific purposes. The successful approaches that may be used at national, regional, metropolitan and provincial city level should ensure route networks are studied, and improvement prioritised.

Route access for specific truck types or truck loads and cargo type is slightly outside the scope but it is highlighted in this report. Road design and performance investment, road use and operation, or road safety impacts of road freight vehicles are likewise discussed. These issues must be strongly address by TRACECA road and traffic regulatory publications.

This guideline has been drafted to list the issues and necessary effort needed to address the complexity and importance of the route network and community safety and ambience. It challenges any existing objectives and freight route network design standards and policy and includes suggests on how to manage it, and the processes that are practical for freight route identification and route planning, for avoiding residential areas or reducing the impact on communities.

This guideline attempts to provide a framework to assist all levels of government and the private sector to understand the importance of better managing different types of freight movement to grow our economy and minimise negative community impacts.

Readers are presented with a collection of successful approaches for road freight networks that reflect the diversity of needs across the nation, as well as processes for planning, identifying and protecting them. The Project team in cooperation and consultation with TRACECA Country representatives has discussed the local issues and best international theory and practice. They offer unified approach for

across the Region.

As TRACECA Region contains important transport corridors between the production national and consuming nations, China and Europe, harmonization of standards and road performance and elimination of potential traffic risks to all road users is importance.

This information should be used to build upon existing State manuals. This will ensure similar approaches are applied for related improvement of road infrastructure in all TRACECA Countries.



**Prepared by**

Dr Alan Ross  
Team Leader  
[Alanross999@gmail.com](mailto:Alanross999@gmail.com)

Dr Dejan Jovanov  
Senior Road Safety Engineer  
[dejan.jovanov68@gmail.com](mailto:dejan.jovanov68@gmail.com)

Mr Walter Viti  
Freight Routing and Safety Engineering specialist  
[viti64@hotmail.com](mailto:viti64@hotmail.com)

## **Table of Contents:**

### **Abbreviations and acronyms**

#### **1. INTRODUCTION**

Scope

Background to TRACECA II

#### **2. UNDERSTANDING THE FREIGHT TASK**

2.1. Freight through traffic routing avoiding residential traffic

2.2 Road and traffic consideration

2.3 Community road users and freight movers

2.4 Freight travel road safety

2.5 Enforcement; driver, vehicle, and cargo

#### **3. FREIGHT ROUTE NETWORK**

3.1. Transport road network identification

3.2. Freight routes and safe and secure parking

3.3. Freight movement control

#### **4. FREIGHT TRANSPORT PLANNING**

4.1. Principles

4.2. Data sources

4.3. Routes and Corridors

4.4. Safe and secure parking

4.5. Driver behaviour

4.6. Stakeholders

4.7 Route Planning Process Guide

#### **5. CHALLENGES**

5.1. Urban areas

5.2. Rural areas

5.3. Cross borders

5.4. Route design considerations

### **REFERENCES**

## Abbreviations and acronyms

BSM	Black Spot Management
EC	European Commission
EU	European Union
IBRD	International Bank for Reconstruction and Development (World Bank)
IFI	International Financing Institutions
ITS	Intelligent Transport Systems
MoIA	Ministry of Internal Affairs
MoI	Ministry of Interior
MoTC	Ministry of Transport and Communications
PIARC	World Road Association (PIARC actually means Permanent International Association of Road Congresses but this name is rarely used)
RSAR	Road Safety Audit
RSI	Road Safety Inspection
SEETO	South-East Europe Transport Observatory
State	Statutory boundary and independent responsible jurisdiction (States of Australia or USA)
TL	Team Leader
ToR	Terms of Reference
TP	Traffic (Road) Police
TRACECA	Transport Corridor Europe-Caucasus-Asia
WE-WC	Western Europe – Western China International Transit Corridor
WHO	World Health Organization

## 1. INTRODUCTION

In accordance with the TRACECA II project's terms of reference, Component 3: "Freight Routes and Parking", this document has been drafted as a result of workshops and consultation meetings on local situations and international best practices regarding freight route management and design, and community safety.

The additional aim was to encourage pilot studies and schemes focused on freight route and facilities and safety.

The freight specialist team mobilised to the TRACECA countries in June 2015, until July 2015. The mission met with various freight stakeholders including transport ministries, traffic and road safety agencies, Traffic Police, and freight associations, as well as local representative for TRACECA. The aim was so to identify and discuss issues experienced locally with freight routes, traffic safety, and needed facilities such as parking, and solutions to avoiding freight route through communities.

This guideline highlights key freight route design considerations so to maximise safety and avoid residential areas, as well as suggestions for a way forward for achieving current international best practices and possibly meeting EU standards.

The details provide a breakdown of common issues and key factors for freight movement management and safety, for consideration by national road, transport, road safety and enforcement agencies for technical and institutional framework improvement.

### 1.1 Scope

This component activity consists of a study, in close cooperation with the beneficiary countries, to identify typical problems and situations that occur in their respective countries for road safety.

The guidelines will outline typical problems and possible solutions that could be applied and would provide a core body of information and guidance that could be incorporated into local guidelines developed in each country.

Prepare guidance on freight through traffic routing to avoid residential areas.

Terms of Reference;

*"...Simple Guidelines will be prepared on how to prevent such through traffic in residential areas. The guidelines will outline typical problems and possible solutions that could be applied and would provide a core body of information/guidance that could be incorporated into local guidelines developed in each country.*

*This would provide a common and consistent approach across the region while allowing each country to localise their country specific guidelines to meet their particular needs. It would lead into the definition and design of a network of major freight routes (for transit traffic) avoiding residential areas.*

*In conjunction with the above objective, the countries will be encouraged, via a regional road safety coordination group, to cooperate in establishing a network of safe and secure parking areas along the major regional routes. International experience will be shared to ensure that the locations and facilities made available are such that they encourage truck drivers to use them, instead of parking at potentially more dangerous parking areas and places not designed for that purpose."*

This would offer a common and consistent approach across the region while allowing each country to localise their country specific guidelines to meet their particular needs. It would lead into the definition and design of a network of major freight routes (for transit traffic) avoiding residential areas.

The countries will be encouraged via a regional road safety coordination group to cooperate in establishing a network of safe and secure parking areas along the major regional routes.

International experience will be shared to ensure that the locations and facilities made available are such that they encourage truck drivers to use them, instead of parking at potentially more dangerous parking areas and places not designed for that purpose.

The Project team will introduce best practice in traffic routing through the production of a guideline document that outlines basic principles that all countries should abide by to avoid commercial traffic passing through residential areas. Alternative strategies and options will be discussed at a joint workshop, following which suitable schemes will be pilot tested in selected countries.

This core activity will consist of the identification and promotion of best practice, of successful cases developed in TRACECA region, either in the course of the implementation of the present project or other similar projects and initiatives. Experience shows that solutions from other countries within a region are often effective in inspiring neighbouring countries to do the same. This activity is very important and great care will be taken in selecting case studies and examples.

## **1.2 Background**

Successes and effective policy framework from other countries will also be referred to as guidance for freight management and enforcement administrators within each TRACECA country.

Guidelines form a comprehensive approach to assist governance in road freight management also for international reference, such as TRACECA.

An initiative to apply these approaches by TRACECA countries has significant potential to learn lessons of best practice, by providing improvements to the transport industry, economic benefits to states and regions and high potential for lifestyle and social benefits for those living or working near major freight roads, especially in urban areas.

### ***Purpose of guidelines***

The guideline encourages development and pilot schemes, and to provide to State road agencies and transport industry:

- ❑ Benefits of identifying, approving and managing urban and rural freight route networks for state road agencies, the transport industry and nearby communities
- ❑ Describing the types of freight routes that state road agencies should consider progressing as a freight route network
- ❑ Outlining criteria (and rules of thumb), a process and jurisdictional success stories in determining freight route networks
- ❑ Provide detailed planning guidance for nominating particular links – which may be sensitive or where there are competing choices – as components of a freight route network.

In essence this guideline outlines how best to identify and protect road routes that are of high importance to road freight, and what to provide as facilities or how to solve potential conflict

between freight movers and vulnerable road.

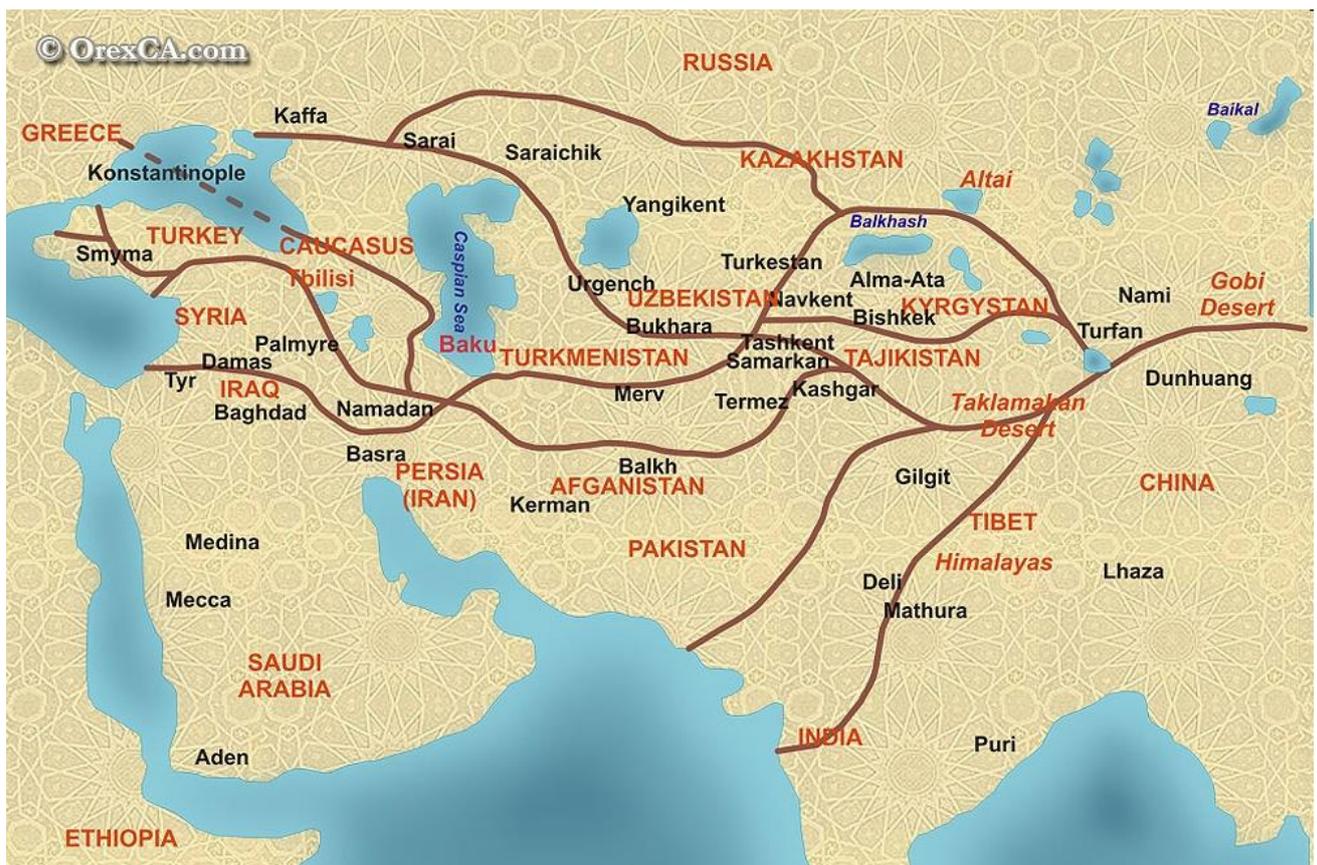
While this guideline provides special guidance about freight routes in urban and rural areas, it should be part of a comprehensive national package of guidelines and standards as well as policies. It must work together with other ministries to assist the State road stakeholders to grow regional economies through facilitating the movement of freight by the transport industry, while reducing the impacts of road freight movement on nearby communities and their safety.

The guideline has been designed to outline the issues for identifying in statutory planning documents on different types of freight networks. It is designed to assist State road agencies to make an effort to address the complexity and importance of the freight activity and route network.

It is necessary to undertake studies to confirm the degree of the issues in your country. In most instance, a more comprehensive planning approach will be needed, especially if coordination is required with neighbouring countries with related freight routes and shared customs borders.

The planning and study reports should involve other stakeholder ministries in which can learn from them and potentially adapt their policy approach and application of resources to their local situation.

#### Key freight routes through TRACECA;

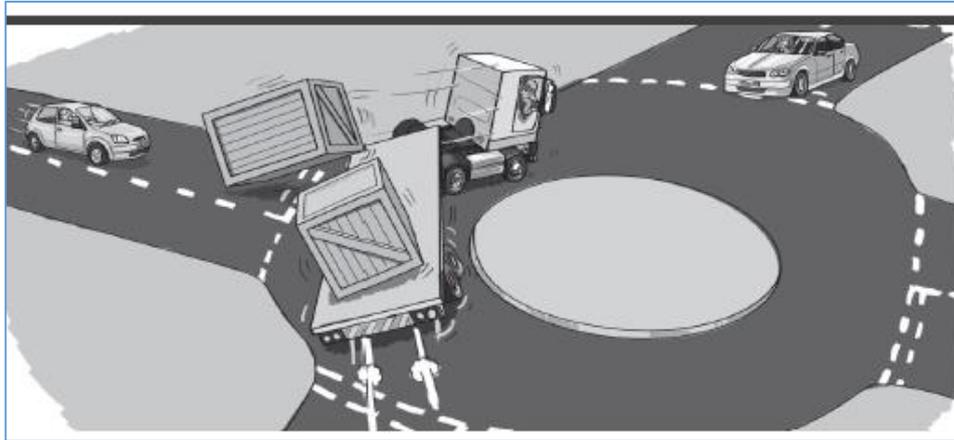


## 2. UNDERSTANDING THE TASK

### 2.1 Freight through traffic routing avoiding residential areas

Avoiding residential areas could only be achieved by specific road planning and construction of infrastructure, and administrative framework from legislation and policy adhered by the freight industry and supported by the preparedness of their drivers, vehicles and cargo.

#### Cargo safety;



Planning and improvement programmes where the conflicts are reduced or completely eliminated. Areas in which have existing freight routes passing through with the community strongly and justifiably objecting will require increased priority for investment and redevelopment.

A technical approach by improving physical aspects of the road and traffic access network reducing the negative impacts for freight and negotiating progressive change of the road and resolution or separation between the source of conflict and specific community members.

Major investment options include:

- Bypasses
- Over passes or under passes including tunnels
- Road division or segmentation between freight and vulnerable road users and community

Minor investment option:

- Service roads, with central traffic island or median
- Overtaking lanes for hill areas, or double lanes for separating slow traffic and freight traffic
- Traffic calming treatment for through freight traffic
- Restriction of access roads or times (within residential areas)
- Restricted vehicle types or weights, or cargo types
- Avoiding air-brakes usage (noise reduction)
- Maintaining road surfaces that are not smooth (reducing vibration and noise)

Industry investment:

- Strict freight policy in line with regional and national ambience and safety objectives
- Higher level driver training and disciplinary performance benchmark for promoting safe driver behaviour, and preparedness when travelling long haul distance with route choice, and with specific types of cargo, including full understanding of traffic regulations and vehicle maintenance

Community:

- Committee establishment providing feedback and consultation of local issues
- Minor tolerance
- Negotiation with the freight industry for sharing benefits of freight activity and route usage

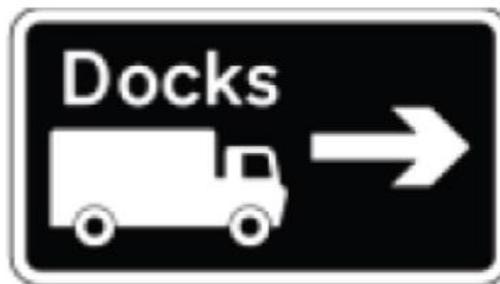
### **Framework**

State ministries responsible for road infrastructure and traffic management are obliged to have identified the roads and route corridors and facilities necessary to facilitate freight movement for domestic and international cargo transit distribution.

This can only be successful if communities accept this progression, and safety concerns are appropriately addressed, along with sharing benefits of the improvement for road access and usage.

Each TRACECA country should have, at its disposal at intra-ministry level, a plan and map of the nation's entire road network in which includes suitable roads specifically used by freight vehicles, of specific sizes and weights, including frequency of cargo type, and daily traffic flow volume (at peaks).

### **Freight directions;**



Scoping and profiling your road network will assist with prioritisation and funding distribution for future development, maintenance and enforcement for freight, as well as identify and verifying community concerns regarding safety and access. Associated with this road network plan, should be linked to a list of road maintenance expenditure each year since keeping the record.

Scoping profiles the investment of each road and of the financial commitment needed for up-keeping the performance of the corridors for community and freight industry support. A focus on road safety performance should link the road incidents and crash records so to highlight areas of concern such as Blackspots, and the freight routes. This information will identify necessary treatments, or establish where freight routes are to be discouraged and roads demoted.

### **Connecting freight generators and road distribution while avoiding residential areas;**



## Freight planning

### Transport infrastructure

- ! condition: e.g. maintenance and improvement of main freight routes
- ! congestion: increases or decreases
- ! expansion or contraction: e.g. altering major freight movement corridors (freeways & primary arterial roads), construction of intermodal facilities
- ! heavy vehicle access to intermodal and other facilities: e.g. queuing, loading/transfers
- ! location of intermodal facilities and their connection with principle arterials and national highway network

### Freight generation

- ! industry developments: e.g. e-commerce, logistics operation (JIT) manufacturing/warehousing systems, changes in competition between operators and modes, technology adoption
- ! changes in product supply or demand, input costs and market prices

### Transport policy

- ! taxes/fees: e.g. registration, road tolls, fuel excise
- ! regulation: e.g. safety, entry/exit barriers, load specifications
- ! subsidies: e.g. infrastructure, fuel

### Land use zoning

- ! changes in location of product suppliers, large multi-purpose retail outlets, warehousing distribution centres

### Local area traffic management

- ! local access: e.g. parking, local street access, designated routes for 'over-dimension' vehicles
- ! environmental and safety concerns: e.g. noise

### Commodities moved

- ! identification of key economic sectors that generate the most important freight traffic within a given geographic region e.g. packaging, disposable foodstuffs,
- ! distinguish specific layers of commodities e.g. refrigerated food products, building materials
- ! allows for a simplified separation of freight into groupings with similar transportation requirements

(Source: Austroads, Planning for Freight in Urban Areas AP-R228, 2003, p24)



## 2.2 Road and traffic consideration

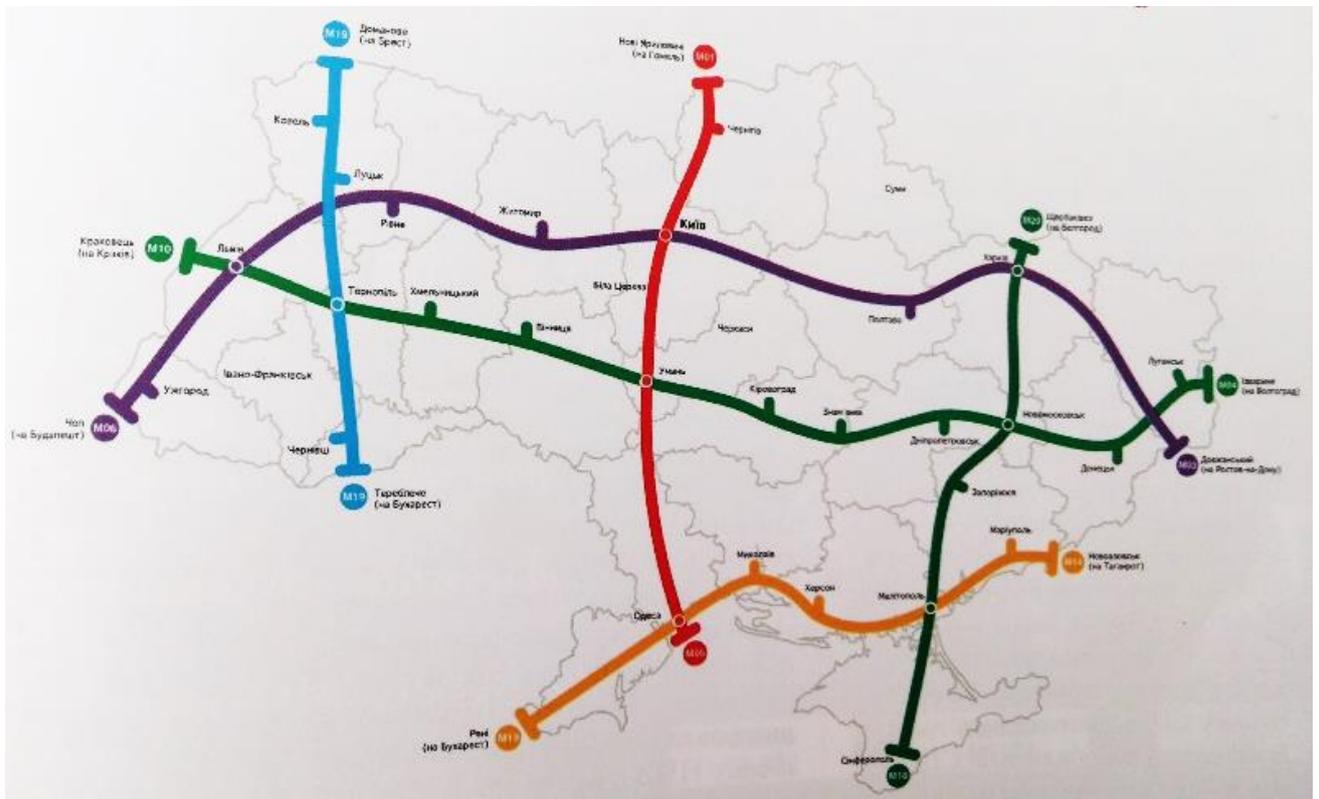
### I. Routes;

The origin and destination of freight traffic must be defined. These are often linked to transport hubs such as sea and air ports, rail yards, industrial districts and national borders and river and mountain crossings. Authorities must also management and control these roads so to ensure traffic flow and safety as well as condition.

Selection and maintenance of the freight corridors should provide uninhibited traffic flow for large heavy vehicles, but also offer opportunities and facility for driver rest, vehicle repair and law enforcement.

In addition, control the movement any conflict between slow and fast moving traffic and if necessary separation between freight vehicles and road users and also reducing any disturbance to residential communities and ambience.

### Route planning at the macro level;



Freight routes must also provide for specific traffic and vehicles, as well as provide access during all weather conditions.

If large or heavy vehicles cannot ensure safety by use of specific routes or sections of roads, an alternative must be provided, with advance warning especially during adverse weather conditions or between summer and winter seasons.

### Determine the key routes, and potential conflict residential areas;

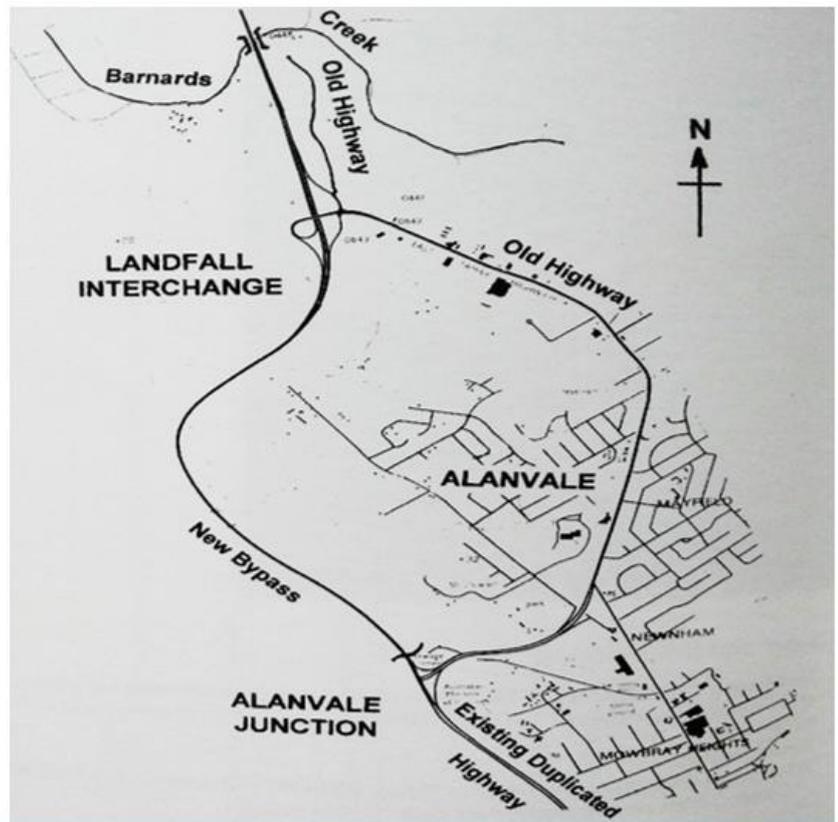


## Freight Route Corridor

## Alternatives (Bypass)

Грузовые Маршрут  
коридора

Альтернативы  
(байпас)



### II. Road infrastructure;

Pavements must be designed for the average weight of the freight as well as provide clearance for height and widths considerations of cargo sizes. New pavements often suffer early repair or maintenance as the road design guidelines being used are not up to date with modern freight weight. Old standards allowed for 12 tonnes but modern freight is carrying 20-40 tonnes, especially if there are quarries and metal yards along the corridor.

Road surfacing is also a significant factor in location where water and ice formation could impact on safety. Open graded surfaces have been used to assist with better traction during heavy rain, or where there is incidental frost or ice formation.

Other climate factors to consider for road surfacing and infrastructure design is where there is dust and wind, as well as mountainous road section. Wide or sheltered carriageways could offer protection for tall vehicles against wind and dust, and escape roads or lanes could ensure trucks with over used brakes can leave the traffic lanes safely when brakes may fail.

This consideration must also include all structures along the corridor.

### III. Structures;

With the consideration of the issues mentioned above, the structures in which must be suited when designed and constructed or upgraded and maintained must address axle loads, vehicle size and turning arc, cargo height and width and driver requirements.

Structure should include culverts, bridges, sign board and gantries, embankments, safety fencing and crash barriers, as well as pavement types and depths. Design for these must take into consideration traffic speeds, weight of vehicles in addition to dimensions of vehicle and cargo.

In ensuring freight routes are suitable these structures require assessment and vetting to confirm tolerances for freight dimensions and vehicle movement (turning arcs) and weights so to provide sufficient pavement flexibility and avoid rutting and prevent cracking (particularly for shoulders and stopping areas).

#### IV. Traffic control devices;

Devices should include; signs (traffic control, advisory and information), variable message signs boards; alarms (flashing lights for weather condition warning; wind, road hazard, traffic incident); traffic signals specifically for controlling freight vehicles particularly when there is potential conflict with other traffic, and the expected delineation devices including road markings, marker studs or rumble strips, reflectors and posts.

#### Controlling freight transport (weight);

Implementation of the regional road safety Action Plan for the Neighbourhood  
East and Central Asia – TRACECA Road Safety II  
EuropeAid/133698/C/SER/Multi  
Project funded by EU

TRACECA

## Стратегическое управление: логистика

Осевая нагрузка  
Статическая  
Динамическая  
(WIM)

Объездная дорога  
Контроль объезда  
Weighing Unit Module  
Weighing Access Point

SAFEGE Consulting Engineers  
IMC worldwide  
Генеральный директор – IMC Worldwide – Grant Thornton – Организация «Сбербанк России»  
Head Office Belgium – Duivendreef 102, B-1200 Brussels, BELGIUM,  
Tel: +32-2-739 46 90, +32-140-14-72 04, Fax: +32 2 762 38 91  
Project Office: Kiev, UKRAINE  
Grant Thornton An instinct for growth  
Granturco & Partners

It is important to state that some countries may consider using speed humps for traffic or speed calming but this is to be discouraged. The alternative is to use a series of traffic islands supported by road markings, marker studs and signs, along with Traffic Police enforcement. Modern enforcement now involves high technological systems such as radar and CCTV.

#### Managing the existing road users;

Грузовые перевозки могут представлять угрозу другим участникам движения.



V. Enforcement;

Traffic Police and Customs must be provided for so to enforce national laws or policies for freight vehicle (and drivers) and cargo control. This includes vehicle speeds, dimensions, access and stopping (parking) restriction, cargo size as well as dangerous or hazardous goods (restricted goods control including human trafficking), and emissions such as CO<sub>2</sub>, carbon and noise and vibration.

Authorities must define strategic locations and facilities along freight corridors in which are suitable for sufficient control of each of these factors, and ensure the safety of the enforcement officers as well as the drivers and their assets.

VI. Customs;

The operation of customs is critical for a nation's incoming and outgoing freight control. Specific facilities must be provided, along with appropriate protocol for processing drivers, vehicles and cargo.

This issue is complicated with differences with driver origin where language could be a barrier for understanding cargo, weight or dimension restrictions, in advance. Facilities should aim to have appropriate staff who are suitably trained and supported by control devices and facilities for checking and withholding goods, drivers and vehicles in a safe and secure area.

VII. International transit;

International agreements and collaboration assist with monitoring and control of international transit of freight, drivers and vehicles. The suitability and success of a freight corridor depends upon its position as well as attraction for freight movers. If agreements to share information and customs control data could ensure better security of State interests, and provide a more efficient movement of a freight route and its cargo processing and road performance.

VIII. Policy and Law;

TRACECA countries have the opportunity to learn the lessons from other countries who have developed freight movement as a main industry. This includes Europe and other countries such as Australia.

The policies and laws from these places could be used to draw upon the current best practices. Most of the issues have already been discussed here but primarily cover cargo control and movement efficiency, safety and security, as well as crime prevention and law enforcement.

IX. Emissions;

Traffic Police and Customs must be provide enforcement of national laws or policies for vehicle control. This includes specification of restriction and prohibition of dangerous or hazardous goods (including seepage, or securing loads in instance of collisions and lost loads), and emissions of the vehicle such as CO<sub>2</sub>, CO, and noise and vibration.

These factors must be covered by policy and law, and enforcement agencies should be supported with appropriate equipment, resources and budgets so to control these factors. Villages and townships are often at risk, and consultation often exposes their vulnerability to such potential hazardous events. It also places importance on monitoring emissions and measuring in accordance to targets or limits.

### **2.3 Community road users**

The relationship between community road users and freight transport is often in conflict. The challenge is to manage slow moving short journey local travellers (pedestrians, bicyclists, motorcyclists, tri-wheelers or agricultural vehicles) mixing with long haul faster bigger moving trucks travelling between ports and towns or inter-city. The alternative is to provide separation and this may impart significant infrastructure costs, and so may not be the first suitable option.

The potential conflicts between freight and other road users is always present, especially in rural areas. Slow moving short journey traffic is in conflict with long haul faster traffic, and most countermeasures involve either separation or traffic calming, or both. Examples of slow movers are agricultural vehicles, animals, market areas where vehicles are constantly moving slowly or stopping.

The ideal situation is to have freight traffic separated by design, and this would mean via service roads, bypasses or overpasses. With every new road project, current best practice requires a committee to be developed that involves the local village or township representative to consult to the project planners and implementers so that road safety issues can be capture early, or, as they develop before escalation. Other options for freight involves restricted access in some areas, such as during specific times or roads, and avoiding direct conflict with vulnerable road users such as schools students and commuters during peak hours.

### **2.4 Freight travel road safety**

Road safety for freight movers means driver safety. Drivers are travelling for long distances over various terrains and weather conditions. There are many hazards and risks in which present themselves in this situation.

**Freight transport planning involve preparation and avoiding hazards;**

Реализация регионального плана действий по безопасности дорожного движения для стран Восточного партнёрства и Центральной Азии – TRACECA Безопасность дорожного движения II  
 EuropeAid/133698/C/SER/Multi  
 Проект финансируется ЕС

TRACECA

- На знаке, расположенном вне паркинга, нанесены:
  - Наименование паркинга
- Информация об услугах
- Наличие свободных парко-мест
- Наборный текст с информацией от паркинга
- Рейтинг паркинга, в данном случае
  - рейтинг безопасности - 3
  - уровень качества - 2

КОНСОЦИУМ SAFEGE – IMC Worldwide – Grant Thornton – Granturco & Partners  
 Головной офис: Бельгия – Жюльетт 92, В-1200 Брюссель, Бельгия.  
 Тел: +32-2-739-46 98, +32-140-747-94, Факс: +32-2-742-38 91  
 Офис проекта: Киев, Украина

Grant Thornton  
 An instinct for growth

Granturco & Partners  
 società - Leasing

Countries who are investing in freight transport and infrastructure realise the difficulty of freight transport. They must also realise government regulation and employment policy must focus on driver fatigue, training and vehicle maintenance as key factors for securing road safety for the drivers, and other road users who are in contact.

Part of this is supporting the freight industry with workable policies and regulations for improved freight movement. This includes domestic transport as well as international freight movers.

Drivers must be employed with an existing level of capability, then obtain training for specific freight driver skills. Training should involve reducing risks while driving and carrying heavy or large loads, and how best to secure them on the vehicle. In addition, regular rest must be obligatory and drivers should plan their route, on known roads capable for tolerating heavy or wide loads, while also providing fuelling, repair and rest and refreshment areas.

These selected roads should avoid ambient areas such villages where possible, and avoid conflicts with vulnerable road users. Vehicle speed and control is imperative for freight road safety. They are many reports from truck drivers that there are inconsiderate private vehicle drivers in which involve freight vehicles in high risk manoeuvres such as cutting in front and creating shorter stopping distances. Drivers must be trained to be vigilant for speed control and also proper use and maintenance of brakes.

In addition, discipline needs to be installed for awareness affects and consumption of alcohol and drug influence on driving behaviour.

## 2.5 Enforcement; driver, vehicle, and cargo

Traffic control authorities and Traffic Police must be in position to carry out enforcement of traffic regulations and laws. These must specifically focus for monitoring driver, vehicle and cargo condition and performances.







Road agencies are designing and constructing major roads carrying freight so major maintenance is prolonged. Road use and operational management practices must be significantly upgraded for key routes. It is becoming increasingly evident that the volume and size of trucks on key roads require new heavy duty pavements and taller, stronger bridges and culverts. Community concerns focus on roads with major freight movements.

These aspects led to a growing realisation that roads carrying major freight movements are different. They perform a different role and function that requires tailored treatment and management, and in some instances exclusive access and usage. (It is important to note that current thinking is to provide freight transit lanes on existing carriageways on corridors in which has no other opportunity to widen. One traffic lane is dedicated only to freight, coaches or similar vehicles). It is understood that major freight roads form a strategic network in which industry can grow, often at the price of local communities.

These networks of major freight roads are crucial to economic development, while the road freight impacts on nearby communities. The road must interact with adjacent land use and requires special consideration and investment in its planning, design, development, maintenance and operation to ensure travel performance and road safety for all that use the road.

This guideline refers to a package that Austroads has developed to assist State road agencies to understand the role and function of freight route networks. To identify and dedicate these networks to specific usage (or shared usage, as necessary), and upgrade their overall management to address industry demand as well as community safety and access requirements.

### ***Urban and rural areas***

Identifying roads as a component of a freight distribution route network has not been a common focus for many road authorities. Exclusive truck access would not be well accepted by the community, and shared roads is equally disputed by residents and those concerned about safety. These announcements have been well accepted by industry but objected by the community.

The key for modern design is to designate freight routes, within urban and rural areas. The objective is to provide freight movers with transit options for avoiding traffic congestion, and for avoiding hazards and risks of conflicts with vulnerable road users, such as schools and the elderly as well as bicyclists and pedestrians.

The key factors in selecting, design, or constructing freight routes are; appropriate speed; manoeuvrability; weight, height and width dimension tolerance of the road carriageway; conflict movements, vulnerable road users; traffic congestion and land usage; and, traffic control and information for origin and destination advice for unfamiliar drivers.

Identifying freight routes should provide varying levels of access and safety to specific road user type, role and function of travel, and should offer best performance during specific timing either during peak or off-peak periods. Both urban and rural roads present different road environments and each must be addressed individually so to resolve specific issues to ensure access and safety efficiency for all.

Freight networks are different from other road sets. These freight routes have specific requirements that need to be incorporated into road agency processes. Unless freight route networks are identified, road agency processes cannot address the needs. If a road agency does not identify a freight route network as a special category for investment, its investment allocation processes for a class of roads are likely to be inconsistent and sub-standard, leading to inefficient economic and outcomes.

Benefits in identifying freight route networks:

1. Provides industry with a level of freight movement guarantee so they can reduce costs and develop their businesses in locations for growth prospects
2. Road agencies can improve processes for road asset management and reduce long term costs during the planning, design, construction, maintenance and operation of roads
3. Road agencies can improve investment allocation for better travel performance outcomes and driving public benefits through better address of freight route networks in urban and rural areas. Local commerce often improves with freight route development
4. Better managed freight roads impacts positively on local communities. This relates to better land use design. Land use planning and development is primarily managed by local governments but can negatively impact on freight routes. National governments can influence this with planning legislation but this requires lengthy consultation. If a shared benefit is established, road agencies can collaborate better for identifying freight routes in statutory planning, with support from local governments, immediately addressing local conditions and avoiding objections and costs
5. Increasing public consultation requiring a greater openness from government assists with better planning and improved road design and road location choice. The community responds very negatively when state road agencies dictate their planning

Governments' policy for freight route network identification must adapt to changing goals for economic growth and social development and amenity in urban and rural areas. Public consultation for identification of important issues, such as road safety and freight access control, plays a strategic benefit for negotiation and benefit delivered over time, securing important freight routes and facilities.

It must be acknowledged that some existing road links must be commandeered for heavily vehicle use as new or as an alternative route on the freight route network. These roads may need improved design

or maintenance for their adjusted role and function. National and regional government must development suitable access in situation of road incidents or climate change and congested land use when road access is blocked. This is more extensive covered by proper planning and consultation, and is required before a freight network can be identified.

### ***Route types***

Freight is diverse in its characteristics and needs road diversity fit for purpose. This is so to minimise the impact on the needs of other vehicles and community needs, while also offering access and safety to freight movers.

These are to be considered in the route planning processes, and can be considered in terms of;

- 'Primary Networks,' serving inter regional and strategic industrial areas, including freight terminals and transport hubs to end-users or further processing,
- 'Distribution Networks,' serving numerous longer distanced origins and destinations in a regional or local area, and
- 'International Networks,' servicing the transitory flow across borders, for north-south and east-west global corridors, where vehicles are not stopping and distributing cargo.

### ***Route approaches***

Decision-making, investment allocation and management of freight route networks should follow a coordinated process irrespective of where their routes or location. However differences between urban and rural areas in the operational and safety issues faced, requires interactions and decisions for a range of actions.

The overall approach is to plan, consult and design, with an urban or rural community focus.

#### **A. Urban freight route network drivers and issues**

Route consideration includes high volume and concentration of road freight:

- Freight route continuity across cities
- Location of inter-modal and freight generating activities adjacent to the route
- Sensitive land uses and activities; noise and vibration impacts in residential areas
- Volume and type of other road traffic; high levels of congestion are typical and the allocation of road space between freight, public transport and private vehicles is an issue in route selection and management. Freight may be restricted between specific times as a solution
- Acceptance; a link may not be ideally developed, but if it is already performing as a freight route due to historical usage, objections cannot be considered completely
- Physical constraints may limit the ability to provide new infrastructure in dense urban areas

#### **B. Rural freight route network drivers and issues**

Route network includes:

- Heavier loads, larger vehicles, may be lower volumes but higher speeds
- Route continuity across regions and interstate, supported by planned and purposeful signs for origin and destination, traffic regulation, road safety awareness and alerts and warnings
- Volume (or tonnage) of road freight is difficult to control because of remote areas and expanse of road network

- Pavements and bridge infrastructure condition and physical constraints must be noted for certain vehicle types and cargo being carried. Enforcement is essential for addressing this
- Freight generating locations and seasonal demands may differ and impact on movements and suitability of some roads for safe operation and community acceptance
- International traffic may require specific monitoring and control
- Trucks that are slower such as in hill terrain mixing with faster moving traffic may require short overtaking lanes on some roads
- Mix of freight and tourism traffic, particularly at weekends and holiday periods may require action and awareness for both road users
- Research must show how rural communities can accommodate trucks as with urban communities. Consideration needs to be given to noise, vibration, speeds, access impacts on adjacent communities, particularly at night
- Enforcement and control

### Major routes

Major Freight Routes are roads that carry very large volumes or constant traffic particularly of heavy freight vehicles on a daily basis. These routes are easily identifiable and must have importance placed on them for performance assurance.

### Conduct traffic studies and data collection for analysis;



Реализация регионального плана действий по безопасности дорожного движения для стран Восточного партнёрства и Центральной Азии – TRACECA Безопасность дорожного движения II  
EuropeAid/133698/C/SER/Multi  
Проект финансируется ЕС



## Примеры

## iRAP






Консорциум SAFEGE – IMC Worldwide – Grant Thornton – Granturo & Partners  
Головной офис: Бельгия – Жюльетт 92, В-1200 Брюссель, Бельгия.  
Тел: +32-2-739.46.98, +32-148-74-72-84, Факс: +32 2 742 39 91  
Офис проекта: Киев, Украина




They consist of inter-city motorways, inter-regional highways, and the linking network of major roads that provide connections between routes and freight storage, generating transit stations and terminals, sea ports and major industrial areas.

In many cases these roads have developed in some way to accommodate freight over time. Often they need to be further developed to minimise impact to the community in which often had existed while the freight developed.

Purposely design major routes often bypass townships in some way and avoid freight traversing through sensitive or vulnerable areas. Purpose built and developed roads must have a minimum level of investment to ensure benefit to all road users and local areas avoiding any negative impacts (including environmental, economical, transport and social).

In rural areas the major freight network is almost similar. They are often determined through historic usage but should be on a national basis by government for strategic network planning and maintenance. The Transport authority should have specific requirements to achieve for the road for meeting industry performance and enforcement objectives. These should be incorporated into a corridor strategic profile and network for freight road programme.

The national network should be supplemented with major freight routes identified by State and local governments, compared with other freight routes as a hierarchy, with specific guidelines for development and maintenance intended to assist and clarify for better driver decision and behaviour.

### ***Route network and links***

Many of the roads that become part of a freight route already carried freight traffic and their usage is unlikely to be contentious with local objectors, or have rejection to significantly change to the amount of traffic carried.

Much will be gained by undertaking a comprehensive route planning process to confirm the role of each road, identifying their hazard and risk areas, and the selection of the best route for defined origin-destination definition.

The focus for managers is primarily on how best to identify, protect and manage the route so that its freight function is enhanced and secured. However, it is recommended that freight route planning guidelines are reviewed to ensure that no factors could impact on effectiveness and acceptability of the decision-making regarding the network.

Questions to be considered before declaring a freight network or link roads include:

- ❑ What roads are freight vehicles using?
- ❑ Does the road meet freight travel and connection objectives?
- ❑ What road users are currently using the road, and how many and when?
- ❑ What are the hazards, behaviour risks, and crash history?
- ❑ Why is the entire corridor route declared?

Network declaration should lead to specific management or funding. A priority is likely to be managed differently to other road of the network due to industry expectations, characteristics of vehicles, wear and tear, and impact of these on other road users and surrounding areas.

- ❑ What are the current land users?

Land use shaped by freight activity adjacent to the road

What are the conflicts, and infrastructure and management required?

❑ Is freight demand expected to continue to operate into the future?

Freight demands can change, and a high level of confidence is necessary if significant freight specific investments are to be made on a route.

❑ Do the freight routes need specific improvement for special vehicles, such as high wide or heavy loads?

❑ What are the impacts of freight vehicles on vertical and horizontal clearances to structures, such as for articulated vehicles?

❑ What is required to maintain road capacity and to ensure compatible vehicle operations?

❑ What are the road safety records on the network and link roads, such as Blackspot areas?

❑ What investment is required by the freight industry?

### **3.2. Freight routes and safe and secure parking**

Safe and secure parking facilities have been traditionally provided for specific functions, such as; emergency stopping (rest and repair); rest and refreshment (possible overnight stays); parking stations for longer term stays, refuelling and refreshment.

This is in addition to statutory parking for Customs and Police enforcement campaigns where drivers and cargo may be detained for some time, and safety and security needs to be provided and assured.

The placement of such facilities have commonly been associated with travel distances, cross border locations, proximity to remote areas or townships where communities have restricted freight vehicle access through the town, but drivers are still near to amenities, and also where Customs and Police authorities require control of drivers, vehicles, and cargo type and weights.

These locations vary for motorways, highways, arterials roads and townships. Distances for long haul routes are commonly spaced evenly for extraordinary road lengths, such as 20-30 kilometres spacing, in addition to placement of fuelling and convenience stations.

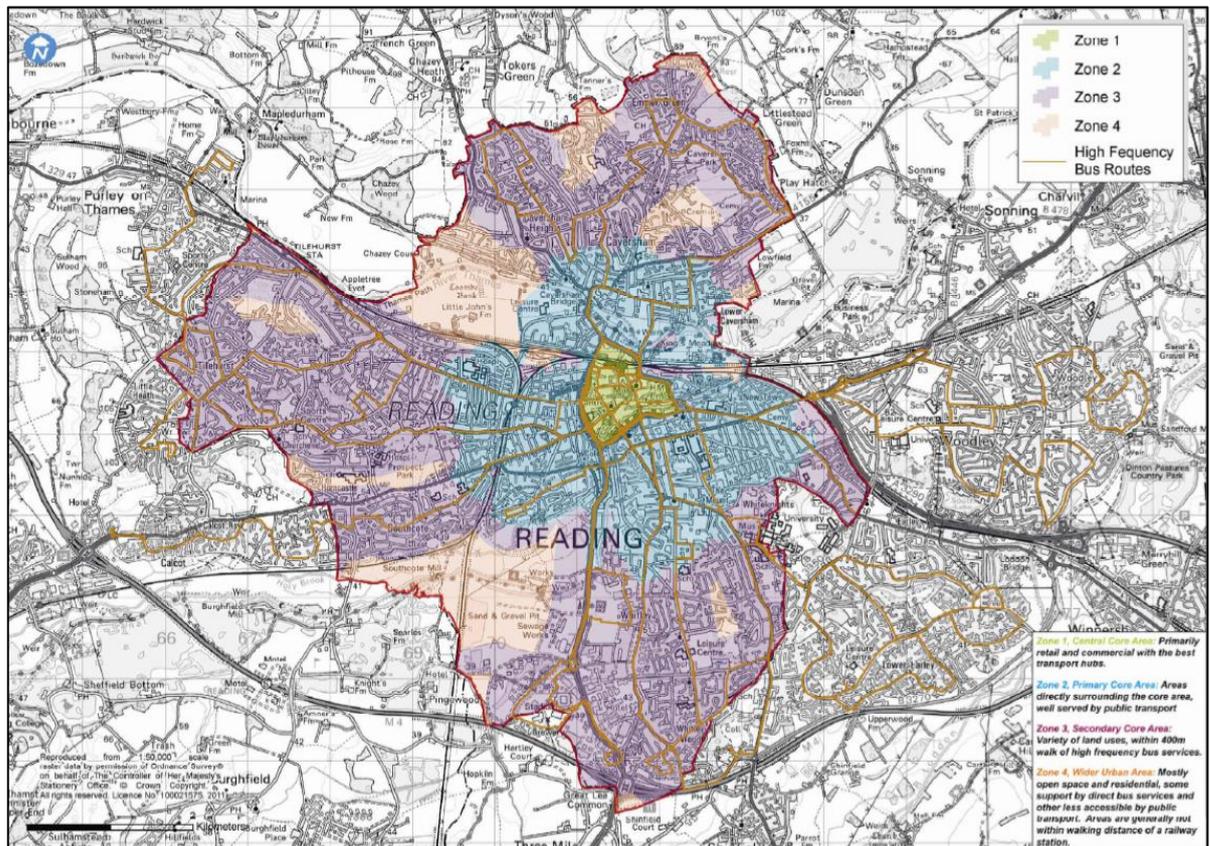
**Small parking area example;**



Some parking facilities may only accommodate drivers with an unsurfaced road side bay, with no street lighting, minor toilet convenience or for refuse disposal. These facilities are generally low cost and may only require the expense of minor clearing land and construction and crushed rock surfacing, with some short lengths of crash barriers or bollards, markers, and advanced signs.

The objective is to provide long haul drivers with options to load/deliver goods where practical, and rest and avoid fatigue driving which is a causal factor for single vehicle collisions.

**Townships should zone the areas according to access and tolerance (Reading, UK);**



All facilities must provide appropriate parking space (secured and specifically serviced), and others should offer suitable deceleration and acceleration lanes so that fast moving freight traffic can safely exit and enter high speed road ways.

**Large parking area example;**



Other more complex facilities usually funded by the freight industry, or local commercial investors, are placed strategically for maximum use and provision of high level conveniences and multiple parking including for sanitary (washing and cleaning), food (restaurant and shopping), modern communication services (internet, office equipment and freight regulatory information and registration), as well as accommodating religious needs (churches and shrines).

These facilities are commonly located outside of townships and near to transport hubs where long waiting periods or rest is required.

These facilities may cover significant land footprints (50-200 bays), and require investment from \$1,000,000 USD upwards, depending on construction costs, facilities and progress staging. The outright benefits of these complex facilities is that it encourages and attracts driver usage and further local investment of support services and staff resources.

**Planning specific freight parking facilities;**



	Maximum Parking Standards			
	Zone 1	Zone 2	Zone 3	Zone 4
<b>Commercial 1 space per m<sup>2</sup></b>				
B1(a) Office	250m <sup>2</sup>	100m <sup>2</sup>	50m <sup>2</sup>	*
B1(b) Research & High Tech	250m <sup>2</sup>	100m <sup>2</sup>	50m <sup>2</sup>	*
B1(c) Light Industrial	250m <sup>2</sup>	125m <sup>2</sup>	100m <sup>2</sup>	*
B2 – B7 General & Specific Industrial	250m <sup>2</sup>	125m <sup>2</sup>	100m <sup>2</sup>	*
B8 Storage & Distribution	250m <sup>2</sup>	200m <sup>2</sup>	150m <sup>2</sup>	*

### 3.3. Freight movement control

The principle factors of freight traffic is, as with any other road motor transport, to define the influences to usage and management such as cost, performance as well as duration.

This information must be collected and assessed so as to avoid obvious conflicts with the community or to identify causal factors to residential community conflicts.



(Austroads)

Control of freight traffic and facilities is essential to achieve a balance, to ensure efficient access and accepted level of safety. These would involve:

- Vehicle type, dimension, axle number, and weight, and performance
- Cargo dimension; weight, height; and cargo width, and cargo type (fragile, perishable, refrigerated, hazardous, dangerous, restricted or prohibited)
- Emissions
- Driver training and skill
- Enforcement and control (customs)

Once these key factors are identified and their planning, implementation, operation and control are being coordinated by stakeholders, the process for movement control becomes more obvious pending available funding and resources as well as the level of political support.

The objectives must always be agreed for movement control, being:

- Provision of suitable and efficient traffic flow and journey time
- Road performance and comfort as well as safety
- Access assurance, and useful information and advice
- Suitable sites for monitoring and control, as well as refuelling and rest

### ***High wide load routes***

Drivers must be informed in advance and prepared for what routes are suitable for high wide roads, and avoid potential risks to community safety, or damage to road infrastructure causing significant repair or traffic journey delay.

These road and travel situations require application for permits to be issued and approved before usage. Any contravention to using unapproved access especially on unsuitable roads must be treated strictly with high penalties for the driver, vehicle and cargo owners. There must be suitable and advanced warning so to discourage such behaviour as the damage to road infrastructure can be extensive, and experienced some time later after the offensive action. Prevention is best!

### **Oversized cargo control;**



**(Austroads)**

High wide load (HWL) routes have a number of names including OSOM (over size over mass), ODOM (over dimension over mass). They are serviced by Restricted Access Vehicles which require a permit from the jurisdiction to access that set of roads. High wide loads are typically associated with agriculture, mining, or large engineering projects such as power stations or manufacturing.

There is a growing trend in heavy fabrication with agriculture and mining industries, so to reduce the level

of on-site fabrication by building large modules in factories and workshops, and then transporting these prefabricated modules to the project site for further assembly. This method of construction has several advantages in terms of time, cost savings and improved quality, particularly when skilled personnel are in short supply in regional areas.

Industry places significant expectation on the roadway. Governments need to be well informed by industry if this demand is expected from the network so to ensure proper movement of freight.

### **Long freight;**

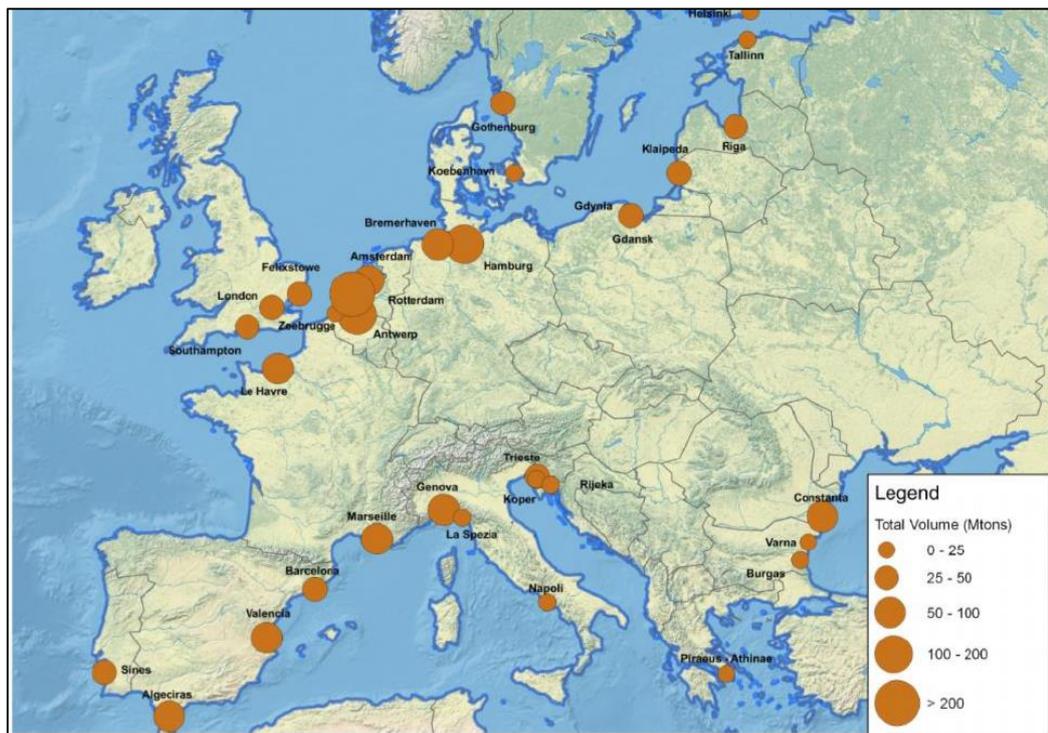


*(Austroads)*

### ***Freight generating areas***

These areas are generally warehouse, container, or port storage or assembly yards where goods are produced or brought into the country from other transport modes.

Distribution begins from these locations outwards to other national regions or across borders to other production houses or end-user places. There should be planned locations, with road characteristics to accommodate likely freight movement and activity generation (such as sea ports).



(Source: EC, Modal Share of Freight Transport to and From EU Ports, Study, 2015)

This requires stronger land development policy, and road and land development linking so one is developed in conjunction with future or developing commercial objectives and defined freight route network investment:

- ❑ National Land Transport Network
- ❑ Roads and highways, which connect areas of strategic freight and economic importance (ports, industrial centres, freight hubs, distribution centres, regional centres, resource provinces)
- ❑ Local government roads provide network connectivity to serve areas of strategic freight importance
- ❑ Roads with a high tonnage of freight currently carried requires investment in maintenance
- ❑ Roads in urban areas must have a minimum investment for community safety, and preventing or treating Blackspots
- ❑ Alternative routes (other than for freight) may be essential but impact on a sensitive areas

### **Hierarchy**

Not all freight routes are equally important. This is typically determined by presence of industry and their demands, and traffic volume totals and peaks, and road connection to manufacturing, storage and shipping terminals, and end users and also borders.

Different ways are used to differentiate important routes that warrant particular supportive management and investment treatments.

Primary freight routes are arterial roads that typically are:

- ❑ Strategically important economic regions (key freight centres, industrial, agricultural and manufacturing areas, intermodals, sea and airports), within and external to a state
- ❑ High volume for heavy freight vehicles through the majority of the day
- ❑ Provide access for long distance freight vehicle movements.

Secondary freight route can be defined as:

- ☐ Supplements primary freight routes
- ☐ Provides sub-regional (urban and rural) access and linking to primary freight routes
- ☐ Lower proportion of heavy freight vehicles than primary routes, but performs a branched distributary function, rather than long hauling from point to point

**Freight Facilities must be located and suited in the best area;**



## **4. FREIGHT ROUTE PLANNING**

### **4.1 Principles**

Irrespective of the type of freight route that is being planned there are principles that should be considered when identifying and deciding on how it should be managed. Designs and policy should cover key community and national issues, and set appropriate and agreeable performance standards and targets.

There must be a clear understanding of roles, objectives and function within the industry chain between freight companies and associations, road infrastructure and traffic management authorities, and traffic and customs Police. Each of these would benefit from collaboration, sharing information and objectives, and being properly resourced with continual development planning.

While in operation, all drivers must be kept informed, alerted and guided while making decisions on and off the road, the community should be assured the freight industry uses trained and disciplined drivers, vehicles must be properly maintained and suited to carry the loads, loads must be legitimate and properly secured to trucks, and freight routes used must be planned and appropriate for the vehicle and cargo being carried while ensuring safety for other road users.

Route and link planning should be specifically addressed in guidelines:

- Route and link planning for national corridor dedication, and local area benefit strategy
- Routes to be fully signed with traffic control devices and information (origin-destination, kilometre markers, rest and fuel areas, warnings, land marks), alignment options, and weight, height and width restrictions of the road and structures, as well as speed limits and advice
- Plans should typically cover a 15 to 20 year period, with commitment from stakeholder chains and planned reviews for improvement. Plans should contain a mission statement of intent, and broadly indicating expectations about future function and likely initiatives so that future governments and authorities share a long term vision
- Priority placed on specific routes for initial attention and funding consideration (improvement, upgrade or maintenance), and limitations in funding must be planned for supplementary revenue options, such as from traffic offences or breaches with cargo with customs
- Set up of national and regional committees for freight issues, incorporating safety and traffic access, enforcement, emissions, and local ambience

Freight routes should be designed to achieve community relevant economic, social and environmental objectives, and operational objectives. These should be responsive to government priorities and policies, as well as regulations and design standards.

Freight routes are part of interactive transport and land use systems. These routes should be specifically planned and managed as an integral part of the road system and economic development.

### **4.2 Data sources**

Information collection, statistics, and feedback from interest groups and community surveys are the modern tools for capturing priorities and concerns with respect to traffic, safety and freight.

Some obvious examples of key sources are:

- a) Traffic volumes (origin and destination)

- b) Crash statistics and Traffic Police reports
- c) Road maintenance expenditure
- d) Climate forecasts and weather reports

Other sources in which should be considered are:

- e) Customs processing data; cargo (permitted and restricted or prohibited); vehicle; and driver
- f) Enforcement statistics regarding law offences; speed; driver behaviour; restricted cargo breaches; emissions (CO<sub>2</sub>, CO, noise and vibration)
- g) Public surveys and focus groups
- h) Local committee feedback and community road safety committees
- i) Road design standards and guideline reviews
- j) Land development planning, including tourism and industry development
- k) Freight Association feedback
- l) Main industry feedback (Mining or quarry, fossil fuel, chemical or steel)
- m) CCTV records

It has been discussed earlier, road authorities must have the best understanding of the route network profile and characteristics. There should be identified what issues are priority, their locations and analysis must identify what is needed to counter any problems or deficiencies. The data collected must be purposeful so to achieve this objective.

### **4.3 Routes and Corridors**

Freight vehicle drivers may have several alternative routes to a major destination. Decisions on routes may be made several hundred kilometres before, and road authorities must play a role in determining the preference. This may include route segments leading up to the route corridors.

Alternative route options to preferred corridors should be by design such as weather affected roads (winter and summer roads) or where heights or widths are larger for bigger vehicles and their cargo, or load weights are more tolerable on purpose built roads were less damage is made on unsuitable roads.

This focus on how vehicles use the network and not on the administrative classification of road links. Administrative classifications must be relevant for the management of the roads. Driver decisions may be influenced on what information is provided on the road or to the freight industry for the most appropriate route. This should occur as an intended plan for network operation for freight vehicles.

In freight corridor planning, logistics efficiency must be priority along with safety. Management of the total logistics chain is necessary and could assist with route selection, improvement and maintenance. Each vehicle mode and cargo type has a potential role to play in this chain. This is how statistics can contribute to a better understanding of freight movement.

Road freight route planning should include analysis of cost effectiveness so to carry freight amongst other road users. Effective multi-use of roads requires the provision of appropriately located facilities, traffic controls such as separation between fast and slow traffic or vulnerable road users, and designing of the road asset. A multi-modal network planning approach focuses on serving on specific areas where freight and other users are address equally and with benefit for each, or rather, address any disadvantages in which may have developed over time.

### ***Route Continuity***

Freight route planning requires location to location planning with specific assessment for each village and township and necessary road facility, from freight origins to destinations so targeted vehicles are able to use the total route.

Alternative routes should not be the first consideration for drivers. Road authorities are then in better position to monitor and control traffic flow and safety. This could include purpose designed and signed arterial roads and local road catchments that link freight generating centres to the corridor network.

On some routes, it may not be feasible to achieve physical design standards, such as traffic lane and shoulder widths along the full route. The maximums and minimums that are appropriate for freight vehicles can be expected to be used on specific route sections. This approach can save design and implementation costs as well as future maintenance expenditure, and must be a consideration for route planners and road operation and maintenance managers.

In most freight roads and routes, including their collector roads, it may be appropriate to accept different design standards in order to achieve route continuity. If a variation of the standards are accepted then constraints may be required on the operation of freight vehicles, such as restricted vehicle speeds, loads, time of access. In these instances, an assessment of the existing situation and needed road design and facility capability requires professional advice for authority decision-making. The objective must be to ensure traffic access, efficient flow and safety for all road users involved.

#### **4.4 Safe and secure parking**

In urban areas road space is often restrictive and the feasibility of freight sharing may influence the choice of a preferred route. Decisions may be necessary on whether road space should be allocated to priority vehicles, where it is typically public transport or freight. Public transport priority is more likely to be supported by most communities. This will help to reduce the demand for private car travel within the corridors, and shift the opportunities for improving freight movement.

For rural areas, freight facilities such as parking are usually kept outside the township precinct, unless there are specific parking and resting areas for long haul drivers. Not many rural communities would readily accept freight traffic passing through their area without some restriction or separation from their vulnerable road users. Routes must be capable to accommodate the vehicles that will be using them, while also providing for local traffic demands and needs.

In some cases there may be a desire to allow vehicles to use the freight route only during certain times. In other situations the route will need to be tested for its ability to physically accommodate these vehicles, in consultation with the local community.

Safety and parking must be design along with selection of freight routes. Administrators and planners must expect large and heavy vehicles need to access conveniences in townships, as well as access any purpose built parking or rest and fuelling areas. This must also be at the benefit of the local community and commercial establishment otherwise negotiation becomes more difficult. This therefore places importance on understanding what freight drivers' needs, what the local community can provide, and how best Traffic Police and Customs carry out monitoring can and control practices.

#### ***Triggers for route safety and parking planning***

There is no simple answer when should a particular section of road be identified as a freight route and what facilities are best suited.

Most roads should be able to accommodate the majority of freight vehicles that operate on the road network. As previously discussed, there are benefits in identifying as early as possible common freight

traffic, their routes and where freight traffic are coming from and to so they can be managed appropriately. This clarity provides understanding what facilities are needed, and where the areas of safety concerns are concentrated.

Safety and security obviously must act against risks to vulnerable road users such as pedestrians and bicyclists, and other slow moving vehicles, and offer a level of security for the driver and freight vehicle and cargo owner.

The safety and security facilities that should be considered are:

- a) Parking bays (overnight or for repair)
- b) Fuelling and rest stations specifically for freight drivers (with security fencing and food and sanitary conveniences including travel advice and legislation information)
- c) Town service roads for traffic separation
- d) Traffic islands (central medians, turning separators, and pedestrians refuges)
- e) Traffic calming treatments and crash barriers for township approaches
- f) Information signs; origin-destination routes, town and landmarks and kilometre markers
- g) Emergency stopping bays, and emergency escape lanes (at hill terrain)
- h) Reinforced shoulders (for tolerating heavy loaded vehicles)
- i) Pedestrian over passes and under passes, or pedestrian crossing traffic signals
- j) Access restriction signs through townships, and supported by recommended stopping areas or advice for through traffic

Factors that determine a route facilities include:

- ☐ Manage freight performance to achieve economic, social and environmental objectives identified for the nation and its region
- ☐ Meeting changing traffic conditions and freight needs; traffic demand, route continuity, safety and crash records
- ☐ Origin and destination routes meeting best freight travel times
- ☐ Encouraged use of one route reduces negative impacts on other routes
- ☐ Historic usage

### ***Cross region and international considerations***

International freight opportunities are recognised as an important aspect for developing economies. This is not just for cross border transitory freight but also for integrated freight. The industry plays a critical role for part production and assembly chains across many industries. In recent history parcel and product delivery from internet purchasing means that manufacturing and packaging occurs where ever economies of scale dictate. Countries should plan and attract this as part of State or national transport plans and commercial development planning.

The difficulty with cross border freight and international supply chains is the dependency upon adequate enforcement controls versus processing times (Customs and Traffic Police). Foreign languages and varying legislation and unfamiliarity with the route network or traffic restrictions contribute to the difficulty for enforcing and processing time. This also impacts on the type of facilities needed especially if drivers, cargo or vehicles need impounding and detention.

A recent phenomenon of modern criminal activity is the issue of trafficking including contraband products as well as humans. This place pressure on authorities to invest in high-technology devices such as sensors, radars, detection devices, and weigh machines (both fixed and mobile stations) for identification of illegal activity and law interventions.

Intelligent transport systems are adding to the facilities of freight route networks and management and control methods. This is a significant investment requirement in addition to the road infrastructure and furniture for simple freight movement.

A comprehensive planning process can resource locations where priorities are evident or demanded. Planning and consultation will provide a sound and defensible basis for decision making. If a rigorous discussion is not followed with action then there is a risk the desired outcomes will not be achieved, and costs for solution may escalate as a result of no-action with needed facilities.

### ***Physical characteristics and challenges***

As discussed earlier there is a need to understand the full logistics chain and identify where constraints occur. The facilities for safety and parking should include current conditions and an estimate of future challenges.

Analysis of the route(s) in sectors or sub-regions that have common characteristics such as road condition, demand, abutting land use can identify common potential weakness. The lessons learnt can be applied across other areas and road links for programming works on flood prone sections, strategic bridges, wind affected roads and selecting alternative routes so to maintain continuity.

Land use along freight routes can impact adversely on the safety and security viability. In particular, facilities for safety and security must take into account the 'last kilometre' of the freight journey. These facilities may be compromised if incompatible with freight sensitive land uses or communities. These locations will require consideration of bypasses or facilities distanced from the restriction.

Other constraints to consider will take the form of topography and terrain and weather conditions in which determine what safety devices are required.

Impediments to planning for facilities can include:

- ❑ Geometric impediments; bridge clearances, railway crossings,
- ❑ Infrastructure condition and repair; weight restrictions, pavement and structure strength
- ❑ Operational impediments; routes cannot achieve optimum truck speeds and are below speed performance targets set for the importance of the route
- ❑ Connectivity impediments; gaps in the network of freight roads, or lack of facilities, or routes are not well known
- ❑ Community objection; benefits of freight traffic is not supported
- ❑ History; road crash record of traffic incidents or tragic collisions
- ❑ Structural limitation or restriction, such as bridges, over passes, underpasses and tunnels
- ❑ Heritage landmarks and archaeological features

In rural areas physical road conditions may present the most significant blocking point that potentially delays the movement of goods, and may pressure freight into considering alternative roads that are unsuitable and longer through restricted areas.

### **4.5 Driver behaviour**

Freight drivers cover those that are properly trained and licensed to control and manage a large heavy vehicle and loads, and those that have been recruited to the role without much guidance and initiation. Whichever driver is placed in a vehicle and is control of a heavy vehicle and its cargo must abide by the principles of safe driving, and be prepared and informed of preferred routes and restricted areas.

It is now international practice that freight drivers familiarise themselves with the planned route and

traffic control and cargo regulations including those across borders. This best practice extends to abiding to local traffic speed restrictions and traffic lane use discipline.

It is evident where freight drivers are breaching their driving performance and obedience especially where there are wheel marks on traffic islands, damaged road furniture and road side shoulders, or where inappropriate roads are being used and surfaces and pavements are being damaged. In addition, regular complaints from residents of truck activity during restricted or ambient hours of the day, or where there are potential of actual conflicts with vulnerable road users. Traffic Police could also be able to identify hazardous locations on freight routes or where freight drivers are abusing traffic regulations such as speed limits.

Best driver behaviour is created and reinforced by government and industry regulation and monitoring and enforcement. If government agencies are making investments on the roads and facilities, freight industry at all levels must abide by best practices and regulations so that the benefits of freight traffic is shared and any negative effects are identified and appropriately treated or prevented.

#### **4.6 Stakeholders**

The core stakeholders for freight traffic and transport are:

- Road and traffic authority (planners, designers, implementers and policy makers)
- Freight logistics companies and associations
- Traffic Police (regulation makers and enforcers)
- Customs officers (cargo controllers)
- Drivers, and owners of vehicles and cargo
- Maintenance Contractors (road and vehicle)
- Local communities and townships (residents and planners)
- Other road users

Each of these stakeholders may influence their needs on freight route planning, facility selection and design, and level of government investment and maintenance commitment.

In order for freight planners to best achieve long term objectives it may be suggested to establish local and regional committees for an integrated approach, and avoid rejections in future plans. The ultimate objective is to provide a platform for sharing the benefit of freight route traffic, especially to those that either contribute most, stand to benefit or stand to be adversely affected such as with safety and security.

#### ***Social and political pressure***

Even if routes meet technical and cost criteria, the social and political concerns can significantly influence the feasibility of freight route and facilities. This can result in the imposition of constraints on the operation of the route. Town centre leaders or sensitive land uses including influential local industry may place political pressure. This situation will warrant investigation and may require significant design consideration such as bypasses, alternate routes or special treatments.

Land use decision-making is usually locally focussed and is subject to many more influences than freight route planning. Local government decision-making will be a major determinant along freight routes and so the plans of local government should be understood and integrated into national plans and so part of the scoping stage. These influences should be identified and factored into the route planning process.

Freight facilities including safety and secure parking are often an afterthought in land use planning rather

than an integral part of land use planning. Public authorities, such as Councils and planning authorities may be more focussed on regulating and restricting freight based land uses rather than understanding and planning for their needs.

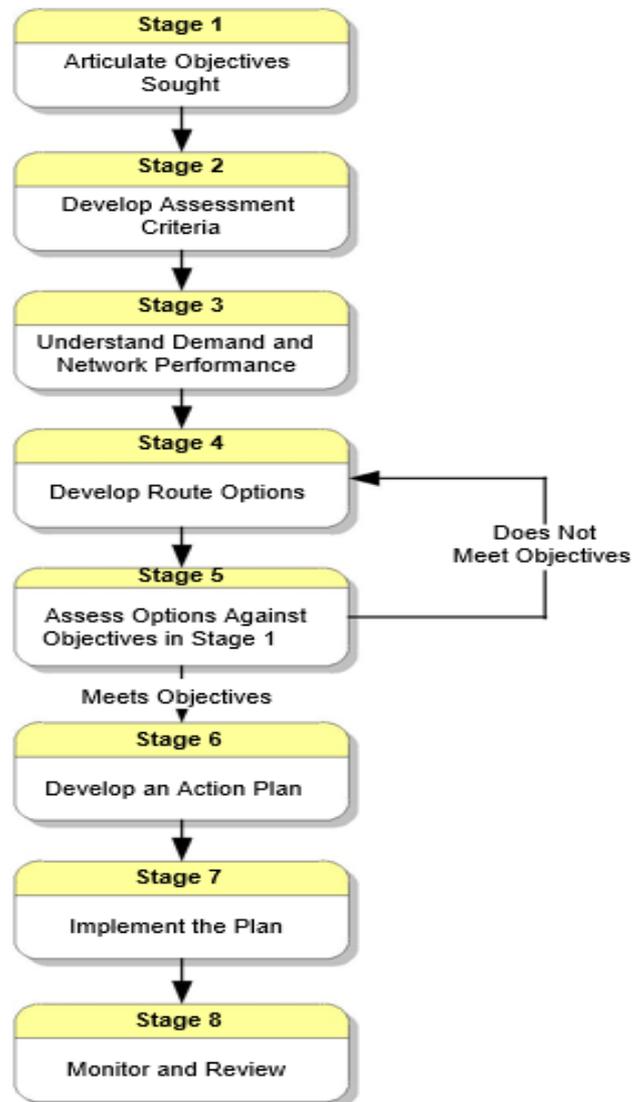
***Land use planners***

The identification of freight routes puts transport agencies in a better position to positively influence councils in their land use decision-making so that planning facility regulations complement freight objectives, rather than responding negatively to freight impacts.

Early and ongoing discussion with these authorities is necessary to ensure freight route planning is not compromised through independent land use and development decisions.

## 4.7 Route Planning Process Guide

### Freight Route Planning Process



(Source: Austroads Research Report, Guideline for Freight Routes in Urban and Rural Areas, AP-R316/07, 2007)

#### **A. Identify objectives**

These have been described at length in previous sections, and priorities must be placed on each according to local preference, situation, and expectations levels.

#### **B. Define the area**

When making decisions on freight routes, the interactions between different corridors and routes within a corridor may be relevant. Although a single route will usually be selected as the designated freight route, the planning process should consider if there is a range of feasible alternative routes and areas of influence.

In some cases these alternatives may be a significant distance from a section of road that is the major focus of the study. For example, freight may be able to use alternative routes between capital cities

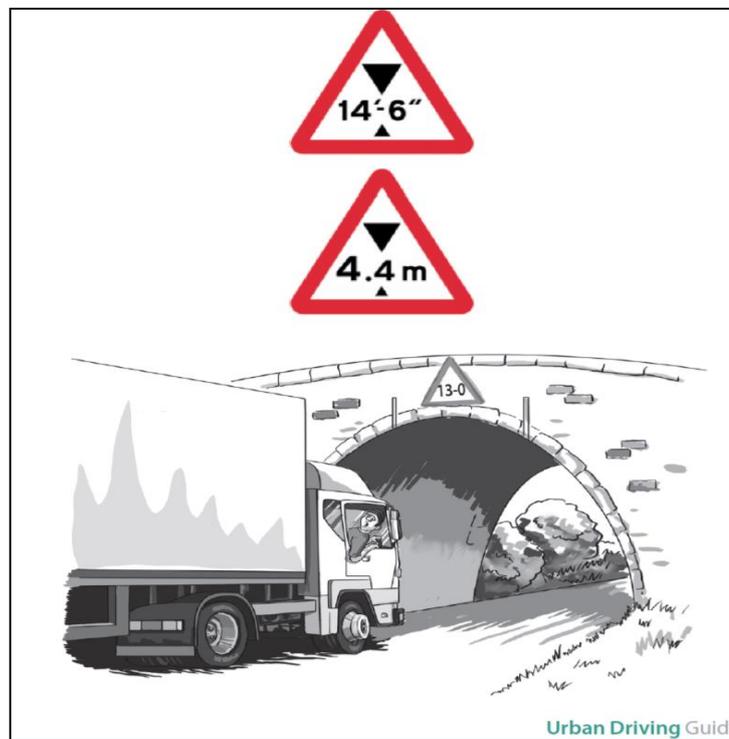
or regions, such as a coastal and inland route, and actions in one corridor may influence freight demands in the other.

These broad network interactions require that a regional or corridor view to be taken of the geographic extent of the study. The study area may include roads coming under different political or road management responsibilities, including roads in other states. This network should include local roads that link to freight generating areas and intermodal sites.

### ***C. Understand freight route demands and needs***

Freight routes do not operate in isolation from their surrounding environment and they form one element of the total transport system. Usually freight routes serve multiple functions for freight and non-freight road users, and for non-road users on abutting land. Furthermore, there are various levels at which the freight system operates. The total system encompasses a national transport network that in turn includes regional/local transport networks, and again these networks encompass freight routes.

#### **Clearances and warnings;**



Freight route planning operates at the detailed level of particular road links but it cannot be undertaken separately from other elements of the system, or the surrounding land activities.

### ***D. Mobility versus accessibility***

As a primary objective for identifying freight routes is to improve economic efficiency and hence economic development, then the ability of freight to access key activities efficiently and to a standard that meets the needs of the products carried is more critical than the ability to move around the whole network. This puts the focus of route planning onto freight accessibility rather than vehicle mobility.

Accessibility can be determined by many more factors than mobility. An understanding of user needs and the impacts of packages of actions on freight efficiency are necessary to understand accessibility.

Accessibility determinants may vary across a network. Depending on what product is carried factors such as travel time reliability, speed, load carrying capacity or road smoothness can all be major determinants of the quality of accessibility. Similarly, if heavy vehicle priority is only required at certain times, such as during harvest time, then accessibility might be met with freight routes that operate seasonally.

### ***E. Consultation***

Public officials are more likely to have success with gaining industry support and input if they understand the freight business and the perspectives of industry. In turn consultation can lead to improved understanding within the freight sector of government processes, such as the checks and balances in the public sector that often determine planning timelines and outcomes.

Freight generators and operators understand the needs of their sector better than most public servants and industry can provide valuable input on issues and potential responses. Freight industry stakeholders can be difficult to identify and engage, particularly if there is scepticism on what will be achieved through the planning process.

There can also be a mismatch in planning horizons between professionals and industry, with the public sector taking a 15-20 year perspective, and private sector vision of 1-1.5 years. Effective consultation is likely to be enhanced by the establishment of good ongoing collaborative relationships with the industry before a specific route planning exercise is started.

Where a freight route may impact on non-industry groups, consultation with these groups will also be necessary in order to ensure that the multiple concerns and objectives of the affected groups are understood.

The views received through consultation will legitimately represent the focussed views of a particular sector and so they should be tested with sound analysis to ensure their completeness and veracity. The results of this analysis should be fed back to those who were involved in the consultation to show how they have been considered during the planning process.

### ***F. Understanding freight demand***

Freight route planning should be based on a 15-20 year planning horizon to reflect the scale of investment that is made in major freight routes and the inertia of many economic systems. In some instances it may be warranted to take a shorter-term perspective if the demand and the benefits are high; linking mining that may have a less than 20 year life to a sea-port. Freight demands are influenced by many factors and where possible forecasts of future flows should be developed from multiple sources to improve understanding of their sensitivity to major drivers.

Influences on route/network demand include:

- ② **Economic Activity;** Understand which industries are likely to drive the economy and the medium/long term viability of industries
- ② **Patterns of Activity;** Changes in the location and magnitude of freight generators and attractors; changes in national and international trade patterns
- ② **Pricing and Cost Structures;** Changes in infrastructure pricing policies; changes in industry cost structures; cost differentials between modes
- ② **Transport Infrastructure and Management;** physical and operational performance
- ② **Regulations;** can facilitate the use of some routes and limit the use of others; safety regulations; vehicle regulations

- ❓ **Vehicle Characteristics;** may limit the alternatives available to large vehicles
- ❓ **Industry practices;** Just in Time, distribution practices
- ❓ **System performance;** Congestion; route continuity; ITS

### ***G. Speed of delivery (reliability of delivery) versus quality of transportation expected***

Factors such as the speed of delivery or the reliability of delivery time may be important depending on the characteristics of the commodity and the logistics chain within which it is being moved. If a commodity has to access an inter-modal site or delivery point within tightly specified time limits then the reliability of the vehicle travel time may be an important factor in route selection. If the commodity carried is susceptible to deterioration e.g. fruits and vegetables, then the time taken to deliver commodities to their destination may be more critical.

### ***H. Local, regional and national freight operating on the one route***

Freight vehicles on a route can be difficult to categorise. Most freight studies are unable to differentiate between local traffic and long distance traffic on any particular section of a route. Most corridors operate as a series of pulses, with traffic using part of a route between major centres.

If the role of potential rural routes are understood within their region and possibly national context then it is possible to build an economic case for intervention. Factors such as system reliability and inefficiencies will impact on their economic impact.

Due to the problems in getting reliable data it is usually necessary to test the robustness of assumptions on demands by comparing multiple primary and secondary sources of data. A combination of bottom up and top down data can provide insights and checks that increase the user's confidence in the available data.

Freight and economic data is often incomplete and dispersed so that access may be required to multiple transport and non-transport data sets to interpret information on demands and needs. Data may be commercially sensitive and confidential. Economic indicators can be used to estimate commodity demands that in turn can be converted to vehicle demands. Changes in the location of freight generating activities can change freight travel patterns.

### ***I. Develop route options***

Identify the range of potential solutions that could achieve the transport and non-transport objectives. If the route cannot be managed appropriately to meet both transport and other objectives then it may not be a viable long term freight route.

### ***J. Planning scenarios***

A technique that can assist in the development of robust strategies where future conditions are uncertain is scenario planning. Scenarios can help focus planning down from a large number of possibilities to a small number of feasible futures that warrant close consideration.

They can be useful for testing the implications and sensitivity of demand assumptions and the implications of alternative actions. Scenarios can be used to test the implications of changes in freight drivers, the cost effectiveness of alternative routes, the impact of different intervention strategies and trigger points that would result in the need for intervention. In order to keep the analysis within reasonable resource commitments approximately 3-4 scenarios should be selected so that they cover a realistic but wide range of futures.

Through the process of scenario development and evaluation an appropriate course of action is likely to

evolve. Sketch planning can be used to facilitate the generation of scenarios for this process. Scenarios can reflect assumptions on demand drivers, mode split, route choice and pricing.

### ***K. Demand scenarios***

Freight is generated by the level, characteristics and distribution of economic activity. Because of the number of factors that can influence these drivers' long-term trends is difficult to forecast with a high degree of certainty.

A range of demand estimates can be developed based on assumptions of future changes to drivers in the key industry groups and the way they use transport that currently or are expected to generate freight.

### ***L. Route choice scenarios***

Changing operating conditions within sections of one route may change freight patterns across a region if these changes impact on travel quality between the alternatives.

### ***M. Determine the route hierarchy***

Not all freight routes are equally important. Part of the process of route selection is to determine where in the hierarchy individual links and routes sit. This hierarchy can be used to determine how the route is to be managed, including whether or not the route is recognised explicitly in land use planning regulations, and funding priorities.

The National Highway Network agency and corridor plans identify the most important links. Jurisdictions use different methods to define their freight hierarchy but these routes are typically determined through similar criteria:

- ☐ Importance as an interregional/interstate link
- ☐ Freight volume
- ☐ Link to major freight activity areas, such as ports and transport hubs
- ☐ Route continuity

### ***N. Policy instruments***

Although the focus of this project is on the identification of freight routes rather than their management, the policy instruments available to manage routes will impact on route planning decisions. Policy instruments can be transport and non-transport based and no single organisation is responsible for their delivery. An understanding of the potential actions and the feasibility of their use is an integral part of route planning and decision-making.

Even if there is agreement between the key stakeholders on the high level objectives there may be different interpretations of what this means in practice on the ground. If the implementation actions are left undefined then they can be interpreted differently by different organisations and an agreement that was assumed to be binding on parties may not be sustained as it is implemented.

This potential confusion over the conversion of strategies into action and the relationship between objectives and policy instruments, particularly if responsibility for implementation is spread over several organisations, reinforces the need to achieve agreement on clearly articulated objectives across organisations at the start of the planning process and agreement on implementation plans at the end.

### ***O. Assess Options***

The assessment of options occurs at various stages during the planning process. At the corridor or network planning level the assessment of options is often based on modelling considerations re: demand analysis. At the route planning level analysis is based primarily on appraisal methods when comparing options including economic analysis and road performance.

Evaluation of road freight routes comprises more than 'predict and provide'. Analysis of freight route alternatives will typically consider consistency with objectives, demand and engineering aspects of the route, and economic, environmental and social elements.

Evaluation methodologies are not value neutral and so the implications of the approaches used should be understood.

### ***P. System performance***

When planning routes level of service is usually used at a tactical level to describe a road. This usually defines parameters that are easily measured at road class and network level:

- ☐ **Condition indicators**, such as roughness, rutting, texture or bridge strength
- ☐ **Configuration parameters**, such as seal width, design speed, bridge width
- ☐ **Traffic flow indicators**, such as traffic flows, accidents and overtaking opportunities
- ☐ **Availability parameters**, such as number of days of closure due to flooding

Each of these parameters is road class specific and has predefined a maximum intervention level and maximum defective condition. Most road authorities use the conditions and configuration intervention criteria to identify 'gaps' in network performance.

### ***Q. Route evaluation***

Significant progress has been made in Australia over the past decade in the development of multi-criteria evaluation processes.

Techniques for the assessment of non-monetary impacts in the project appraisal process which are important for integrated transport and land use planning projects being developed by state and national agencies. These assess the environmental, land use and social outcomes of projects using multi-criteria assessment, which either incorporates or supports the more traditional Benefit Cost Assessment.

The level of analysis that is appropriate will vary with the stage in decision-making – more detailed analysis is required as strategies and projects are refined. Strategic and rapid appraisal is usually necessary during route planning.

### ***R. Monitor and Review***

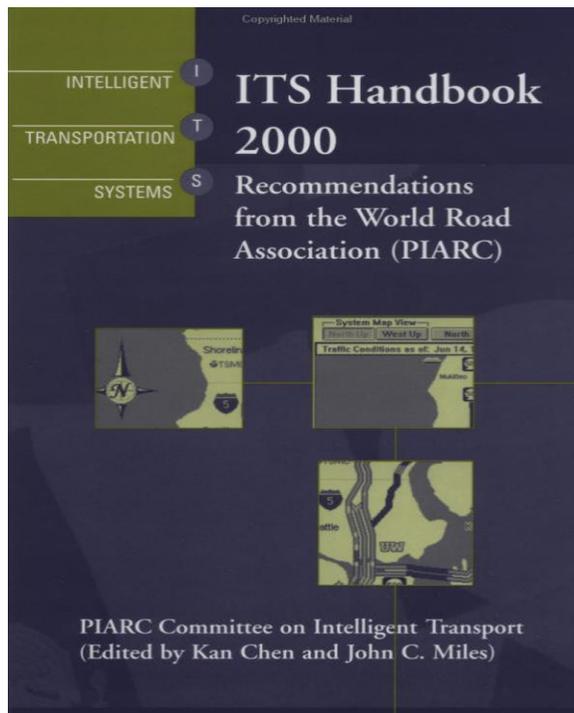
The primary measure of effectiveness for a route strategy can be measured in terms of its ability to achieve the objectives and outcomes set.

This can include:

- ☐ Achievement of the corridor or route objectives e.g. improving access of grain to rail silos
- ☐ Achievement of route performance targets e.g. safety, speed
- ☐ Support for high level objectives e.g. increase in the number of jobs in a region

Effectiveness of the planning processes should also be reviewed so that lessons from each route strategy can be built on for future activities. Measures could be the degree to which agencies understood and

implemented the route strategy, or was on-ground implementation consistent with the adopted action plan. Whilst the monitor and review stage is an essential part of any project the level of resourcing of this phase is often low.



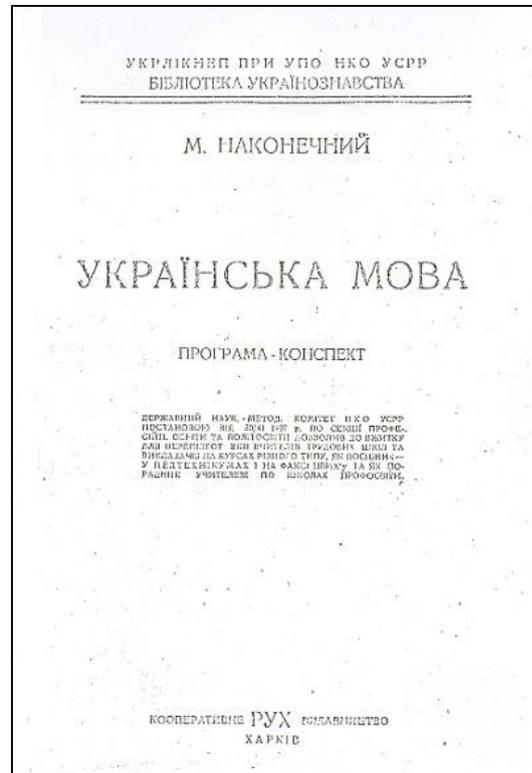
The key principles of a performance review of a route strategy/plan/project include:

- i. Measurement of actual versus desired freight transport system outcomes – these involve the comparison of ‘ex-post’ versus ‘ex-ante’ studies and whether specific performance targets were met. Performance targets can include, but not be limited to efficiency, safety, security, the environment, social equity and economic ends.
- ii. The actual effectiveness of the implemented plan (policies and projects) in supporting or undermining specific performance targets agreed to at the beginning of the process. In other words did the project over-perform or under-perform and what were the causes
- iii. The effectiveness of the broader freight transport system management framework in achieving the desired outcomes/objectives. Post completion evaluation is usually bottom up beginning with how well outputs were delivered (inputs and project management processes), whether the outputs affected the performance of the system in a positive/intended way, and furthermore whether the use of the system leads to the appropriate outcomes (supports or undermines).

## 5. CHALLENGES

The primary objective should be to ensure road infrastructure and traffic management and control is supported by suitable policy, strategic planning, and design standards and enforcement.

### GOST Road Design Standards;



Governments will need to modernise as well as learn lessons from other countries. This requires appropriate investment and funding for road planning, maintenance, and resources and their training. The following are the current issues for consideration by any country when investing in freight route development or enhancement.

### 5.1 Urban areas

#### Access;

In the discussion of freight routes and communities, the challenge must be to offer access to all road users, fast and slow, large and vulnerable, local or long haul travellers.

Urban planning and road design will be the key to achieve this, using the lessons from other projects and countries, and keeping standards and policies updated for meeting international best practices while always focusing on future developments.

#### Safety;

Prevention of conflicts, collisions and injuries will provide the most benefit based upon appropriate investment and skills development and programmes. Monitoring road safety issues and collecting key data will be fundamental for understanding what priorities need attention and where they occur.

#### Ambience;

Often freight routes through urban areas have been long established, but road authorities and town leaders must still be obliged for improvement and ensuring an acceptable level of safety and access for local communities.

Each urban area must have produced a list of areas that restrict as well as encourage freight activity and access. These must be promoted and freight industry informed for avoid any conflicts, but ensuring a community ambience at specific times and places. It is important to link freight vehicle emission to this category, especially for meeting community expectations as well as national emission targets.

### **Traffic congestion;**

Traffic flow and access and route linking will be a key priority for countries wanting to develop or enhance their freight industry. As with road safety, traffic congestion must be monitored and responded with appropriate action plans, resources and solution options suitable for keep priority traffic moving without an increase in risks to safety.

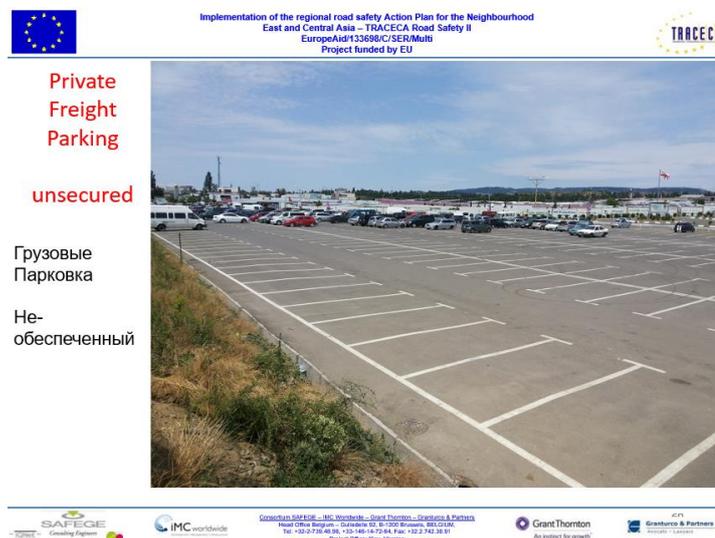
### **Traffic conflicts;**

Freight route networks and road links are essential for connecting freight traffic from transport hubs and storage and cargo entry centres. Purposely planned routes that avoid congested community centres and complex cross roads and intersections must commence from initiation of freight route strategies, through to constant monitoring, improvement and maintenance of the routes so to ensure conflicts are identified and resolved.

There is a need to establish regional committees in which are linked to national bodies and road safety and traffic management agencies. The planning and road design strategies must be shared and agreed, and any future issues should be prioritised so that important conflicts are addressed and minor issues are appropriately monitored, reported for further investigation.

### **Facilities;**

Space availability and support for new or enlarged freight facilities is restrictive. Support or endorsement is often improved by sharing the benefits achieved through improved freight facilities.



Freight vehicles are becoming larger and heavier, including their cargo. Providing for this development in future may not be possible. Identifying areas for potential land and facility development, and inviting investors for commercial planning and development may be one way for progress.

Otherwise, expansion for accommodating larger vehicles may be further restricted in urban areas. This may change the economic and social balance of an area as the activity for freight shifts or reduces. Planning authorities must be prepared for anticipation of these events, and design contingencies for adaptation.

## **5.2 Rural areas**

### **Safety and traffic conflicts;**

Road incidents and traffic collisions injury history records must be maintain and accessible to road safety stakeholders. Assessment and analysis of conflicts can then permit prioritisation of resources and budgets for countermeasures, or further investigation. Any safety issues or development of hazards must be identified as early as possible. Solutions may take the form of simple road maintenance or road improvements of new infrastructure.



### **Speed control;**

Traffic speed management is a particular road safety issues, not only associated with freight traffic. Long straight roads (urban or rural) encourage some drivers to exceed limits. It is essential that road safety awareness signs and traffic speed countermeasures are placed at these vulnerable locations. They should also be supported by regular Traffic Police presence and enforcement campaigns, especially on approach to villages and townships. Having said this, speed limit signing must be provided on freight specific routes, and reinforced with repeater signs and related road markings.

### **Ambience;**

Freight vehicles that need to travel during the night or close to residential areas but best when noise and vibration is minimised. The challenges are to maintain movement of the freight traffic without slowing down or sudden stopping. This will require potential hazards to be investigated and designed out of the route. Noise is a particular issue for trucks, with empty containers, and travel on hilly roads or when surfaces are not smooth. Instances when ambience must be assured for the communities could restrict freight travel during certain hours or days, with provision of alternative routes or bypasses.

### **Facilities;**

Specific facilities for rural areas may include parking in remote areas, as well as service roads for freight routes that pass through villages and townships. Objectives for these must be so to provide options for safety and efficiency for freight drivers and local road users, especially the vulnerable.

**Some facilities can be developed from existing infrastructure;**



Private  
Freight  
Parking

secured

Грузовые  
Парковка

обеспеченный



In addition to these options, are rest and fuelling stations in which meet freight route needs as well as provides support to local industry and employment in the rural areas.

### 5.3 Cross borders

#### **Cargo processing time;**

During many consultation meetings for TRACECA II project, it was commented that freight cargo processing time at borders sometimes takes multiple hours or days. During winter conditions or road with restricted road widths, traffic lanes and alternative roads can be a safety and security matter for drivers and local communities.

Current international best practices is to conduct monitoring and control in efficient time, so that freight journey times and costs are also kept to a minimum. If peak traffic volumes are congested at the borders, there may be a contingency to stage a measured quantity of vehicles for border processing at a set time. This may require advanced agreements and information to freight carriers, and provision of holding centres or freight parking bays.

#### **Information and languages;**

Countries in which experience freight drivers from many nations of varying languages may consider preparing advisory information in multi lingual options, suited to the drivers' origins. This will also assist with dissemination of traffic and Customs' regulations and restrictions, as well as discouraging law offences or contraband. It may also assist with development improved road safety awareness and best driver behaviour when entering the country.

#### **Collaboration between nations;**

Cross border relations is essential for establishing security and Customs measures where borders share

freight route corridors. It is recommended that information be shared especially for cargo and driver and vehicle monitoring and enforcement, so that congestion at the borders are effective but thorough and efficient. This can only be achieved if resources are shared and collaboration is achieved on a daily basis.

#### **Trafficking;**

A modern phenomenon has developed in recent years which is human trafficking. This is fact has particularly affected European and eastern European freight routes. There will be no limits to this geographically should the preferred option of freight transport be used for this. Government agencies and immigration offices must participate in national policies and enforcement practices involving freight transport and route network.

#### **5.4 Route design and facility considerations**

##### **Width, height, and weight;**

Network routes, roadways, traffic lanes and service roads including road structures must offer sufficient clearance and manoeuvrability as well as strength. Government policy and road authority strategies and programmes must be prepared to plan, assess and implement improvement and maintenance works so to ensure road performance to current and future freight traffic needs.

##### **Avoiding restricted areas;**



The freight industry must be given information regarding any restrictions as well as being encouraged for using special routes specific for certain freight dimensions and weights. Advanced journey preparation and information should include warnings and alerts on the road. In addition, specific freight use roads or routes should be considered for separation from village or township areas therefore avoiding any conflicts with residential communities.

##### **Facilities; monitoring, parking and other;**

Freight route facilities should include specific provisions for long haul drivers, community safety and Customs and Traffic regulation enforcement. Parking provision must reflect industry feedback as well local regional and community consultation. Parking facilities should aim to provide a mixture of simple and complex parking stations, but at regular distances, with advanced notice, for drivers during various journey times. These facilities play a significant role for road safety and driver fatigue solution.

CCTV and sensors are now actively informing road authorities of enforcement monitoring as well as statistical data collection for detail analysis including crash and injury history reporting.

**Shoulders;**

Decision for surfaced and unsurfaced shoulders must be made with expectation that freight vehicles occasionally will stop or travel on them. Cracking of asphalt or pavements, rutting or drainage issues commonly develop as a result. Strength of pavement and edges as well as road markings must be adequate on installation or regularly maintained. Otherwise, expenditure for repair or rehabilitation of the entire carriageway may eventually be inevitable.

## REFERENCES

- 1) CATALOGUE OF DESIGN SAFETY PROBLEMS AND PRACTICAL COUNTERMEASURES, World Road Association (PIARC), Paris, 2009
- 2) DIRECTIVE ON ROAD INFRASTRUCTURE SAFETY MANAGEMENT No 96/2008, European Parliament and of the Council, Brussels, 2008
- 3) DRAFT MANUAL FOR ROAD SAFETY AUDIT, Azerroadservice, Baku, 2009
- 4) DRAFT MANUAL FOR ROAD SAFETY AUDIT, KazAvtoZhol, Astana, 2014
- 5) DRAFT ROAD SAFETY AUDIT MANUAL, Kyrgyzstan, Bishkek, 2012
- 6) Elvik, R. & Vaa, T.: THE HANDBOOK OF ROAD SAFETY MEASURES, Elsevier, Amsterdam, 2004
- 7) GOOD-PRACTICE GUIDELINES TO INFRASTRUCTURAL ROAD SAFETY, European Union Road Federation, 2002
- 8) GUIDELINES FOR ROAD SAFETY AUDITS, German Road and Transportation Research Association (FGSV), Edition 2002
- 9) GUIDELINES FOR URBAN SAFETY MANAGEMENT, Institution of highways and transportation, London, 1990
- 10) IMPROVING GLOBAL ROAD SAFETY, Resolution 60/5, United Nations, General Assembly, Geneva, 2005
- 11) M. Belcher, S. Proctor & R. Cook: PRACTICAL ROAD SAFETY AUDITING, TMS, 2nd Edition, 2008
- 12) MANUAL OF ROAD SAFETY AUDIT, Road Directorate, Denmark, 1997
- 13) ROAD SAFETY AUDIT – BEST PRACTICE GUIDELINES, QUALIFICATION FOR AUDITORS AND “PROGRAMMING”, RiPCORD-ISEREST Project – WP4, EU Project, 2008
- 14) ROAD SAFETY AUDIT AND SAFETY IMPACT ASSESSMENT, European Transport Safety Council, Brussels, 1997
- 15) ROAD SAFETY AUDIT GUIDE - FOR USE ON ALBANIAN ROADS, Ministry of Transport, Albania 2008
- 16) ROAD SAFETY AUDIT GUIDELINE, World Road Association (PIARC), Paris, 2007
- 17) ROAD SAFETY AUDIT GUIDELINES, National Roads Authority, Dublin, 2004
- 18) ROAD SAFETY AUDIT GUIDELINES, University of New Brunswick-Transportation Group, Canada, 1999
- 19) ROAD SAFETY AUDIT MANUAL, South East Europe Transport Observatory (SEETO), EC/SEETO, 2009
- 20) ROAD SAFETY AUDIT, Austroads, Australia, 1994
- 21) ROAD SAFETY AUDITS: A SYNTHESIS OF HIGHWAY PRACTICE, Transport Research Board, USA, Washington D.C., 2004
- 22) ROAD SAFETY INSPECTION – BEST PRACTICE AND IMPLEMENTATION PLAN, RiPCORD-ISEREST Project – WP5, EU Project, 2008
- 23) ROAD SAFETY INSPECTION GUIDELINE, World Road Association (PIARC), Paris, 2007
- 24) ROAD SAFETY INSPECTION MANUAL, South East Europe Transport Observatory (SEETO), EC/SEETO, 2009
- 25) ROAD SAFETY MANUAL, World Road Association (PIARC), Paris, 2003
- 26) SAFETY AUDIT OF ROAD DESIGN. GUIDELINES FOR DESIGN AND IMPLEMENTATION, Finnish Road Administration, Helsinki, 2002
- 27) SUSTAINABLE SAFE ROAD DESIGN: A PRACTICAL MANUAL, World Bank, 2005
- 28) WORLD DISASTERS REPORT, WHO, Geneva, 2002
- 29) WORLD REPORT ON ROAD TRAFFIC INJURY PREVENTION, WHO, Geneva, 2004
- 30) Austroads Publications, 2007 and 2003